

## 4.0 Cumulative Impacts

### 4.1 CEQA Requirements

Cumulative impacts are defined in the CEQA Guidelines (14 California Code of Regulations (CCR) Section 15355) as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” A cumulative impact occurs from “the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time” (14 CCR Section 15355(b)).

Consistent with the CEQA Guidelines (14 CCR Section 15130(a)), the discussion of cumulative impacts in this section focuses on significant and potentially significant cumulative impacts. The CEQA Guidelines (14 CCR Section 15130(b)) provide the following guidance:

*The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.*

### 4.2 Geographic Scope of Effects of the Proposed Program

The approach and geographic scope of the cumulative effects evaluation vary depending on the resource area being analyzed. Table 4.2-1 defines the geographic scope of the effects of the CVFPP for each of the resource topics addressed in this PEIR.

1 **Table 4.2-1. Geographic Context for Cumulative Analysis**

Resource Topic	Geographic Area
Aesthetics	Extended SPA and Sacramento and San Joaquin Valley watersheds
Agriculture and Forestry Resources	Extended SPA and Sacramento and San Joaquin Valley watersheds
Air Quality	Air basins within Extended SPA and Sacramento and San Joaquin Valley watersheds
Biological Resources—Aquatic	Waterways within Extended SPA and Sacramento and San Joaquin Valley watersheds
Biological Resources—Terrestrial	Extended SPA and Sacramento and San Joaquin Valley watersheds
Climate Change and Greenhouse Gas Emissions	Global
Cultural and Historic Resources	Extended SPA and Sacramento and San Joaquin Valley watersheds
Energy	Extended SPA and Sacramento and San Joaquin Valley watersheds
Geology, Soils, and Seismicity (Including Mineral and Paleontological Resources)	Extended SPA and Sacramento and San Joaquin Valley watersheds
Groundwater Resources	Sacramento River, San Joaquin Valley, and San Francisco Bay hydrologic regions and SoCal/coastal CVP/SWP service areas*
Hazards and Hazardous Materials	Extended SPA and Sacramento and San Joaquin Valley watersheds
Hydrology	Extended SPA and Sacramento and San Joaquin Valley watersheds
Land Use and Planning	Extended SPA and Sacramento and San Joaquin Valley watersheds
Noise	Extended SPA and Sacramento and San Joaquin Valley watersheds
Population, Employment, and Housing	Extended SPA and Sacramento and San Joaquin Valley watersheds
Public Services	Extended SPA and Sacramento and San Joaquin Valley watersheds

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**Table 4.2-1. Geographic Context for Cumulative Analysis (contd.)**

Resource Topic	Geographic Area
Recreation	Extended SPA and Sacramento and San Joaquin Valley watersheds
Transportation and Traffic	Extended SPA
Utilities and Service Systems	Extended SPA and Sacramento and San Joaquin Valley watersheds
Water Quality	Extended SPA and Sacramento and San Joaquin Valley watersheds

Source: Data compiled by AECOM in 2011

Note:

\* Because hydrologic regions cross the boundaries of the geographic areas in the study area, the discussion in the "Groundwater Resources" section is organized by hydrologic region rather than by the geographic areas of the study area. The SoCal/coastal CVP/SWP service areas are specifically addressed because of the potential for groundwater in those areas to be affected by flood management activities under the proposed program.

Key:

CVP = Central Valley Project

Extended SPA = extended systemwide planning area

SWP = State Water Project

## 4.3 Related Projects

### 4.3.1 Past and Present Projects and Activities and Cumulative Context

Many past and present projects and activities have occurred and are occurring in the study area. The effects of these past and present projects and activities have strongly influenced existing conditions, and some past projects are still affecting resources. Past and present projects and activities have contributed on a cumulative basis to the existing environment within the study area via various mechanisms, such as the following:

- Population growth and associated development of socioeconomic resources and infrastructure
- Conversion of natural vegetation to agricultural and developed land uses, and subsequent conversion or restoration of some agricultural lands to developed or natural lands
- Alteration of riverine hydrologic and geomorphic processes by flood management, water supply management, mining activities, and other activities
- Introduction of nonnative plant and animal species

- 1 Several major past and present projects are considered in the cumulative  
2 impact analysis. The list below focuses on major projects directly related to  
3 the CVFPP within the study area.
- 4 • Sacramento River Flood Control Project
  - 5 • Sacramento River Bank Protection Project
  - 6 • Shasta Dam and operations
  - 7 • Red Bluff Diversion Dam and operations
  - 8 • Oroville Dam and operations
  - 9 • Folsom Dam and operations
  - 10 • Friant Dam and operations
  - 11 • New Bullards Bar Dam and operations
  - 12 • Natomas Levee Improvement Program
  - 13 • Long-Term Management Strategy for Dredged Material in the Delta
  - 14 • Red Bluff Diversion Dam Fish Passage Improvement Project
  - 15 • American River Watershed (Folsom Dam Modifications) Joint Federal  
16 Project
  - 17 • South Sacramento County Streams Group Project
  - 18 • West Sacramento North Area Project Early Implementation Program  
19 (EIP)
  - 20 • Merced County Streams Group Project
  - 21 • Knights Landing Ridge Drainage District Levee Repair
  - 22 • Freeport Regional Water Project
  - 23 • Contra Costa Water District Middle River Intake and Pump Station
  - 24 • Lower San Joaquin River and Tributaries Project
  - 25 • Levee Repairs Program (funded by the Disaster Preparedness and Flood  
26 Prevention Bond Act of 2006)

- Feather River Levee Setback Project
- Bear River Setback Levee Project
- Long-Term Central Valley Project (CVP) and State Water Project (SWP) Operations Criteria and Plan
- Upper Yuba Project (Three Rivers Levee Improvement Program EIP)

#### 4.3.2 Reasonably Foreseeable Future Projects

The CEQA Guidelines identify two basic methods for establishing the cumulative context in which a project is to be considered: using a list of past, present, and probable future projects (the “list approach”) and using projections from an adopted local, regional, or statewide plan, or related planning document that describes or evaluates conditions contributing to the cumulative effect, or a certified EIR for such a planning document (the “plan approach”). For this cumulative impact analysis, the list approach and the plan approach have been combined in the analysis of cumulative impacts to generate the most reliable assessment of future conditions possible.

##### ***Plans Describing Conditions Contributing to Cumulative Effects***

A number of statewide, regional, and local plans were considered in the CVFPP cumulative analysis. Plans included in the cumulative analysis provide or are based on projections or otherwise describe conditions that contribute to overall cumulative effects in the study area; some also provide requirements to avoid or substantially lessen a cumulative problem (as described in Section 15064(h)(3) of the CEQA Guidelines). Projections or descriptions of future conditions may have been derived from the adopted plan, its CEQA document, or related studies or regional modeling. The plans listed below relate, on a regional or statewide level, to issues such as air quality, transportation, habitat preservation, and water.

- *California Water Plan Update 2009* (DWR 2009)
- *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board: Central Valley Region, the Sacramento River Basin and San Joaquin River Basin* (Central Valley RWQCB 2009)
- *The East Bay Municipal Utility District’s WSMP 2040: Water Supply Management Program 2040* (EBMUD 2009)
- *The California Air Resources Board’s Climate Change Scoping Plan: A Framework for Change* (CARB 2008)

- 1 • *PM<sub>10</sub> Implementation/Maintenance Plan and Redesignation Request for*  
2 *Sacramento County (SMAQMD 2010)*
- 3 • *Sacramento Regional 8-Hour Ozone Attainment and Reasonable*  
4 *Further Progress Plan (EDCAQMD et al. 2008)*
- 5 • *The San Joaquin Valley Air Pollution Control District's 2007 Ozone*  
6 *Plan (SJVAPCD 2007a)*
- 7 • *The San Joaquin Valley Air Pollution Control District's Extreme Ozone*  
8 *Attainment Demonstration Plan (SJVAPCD 2004)*
- 9 • *The San Joaquin Valley Air Pollution Control District's 2007 PM<sub>10</sub>*  
10 *Maintenance Plan and Request for Redesignation (SJVAPCD 2007b)*
- 11 • *The San Joaquin Valley Air Pollution Control District's San Joaquin*  
12 *Valley 2008 PM<sub>2.5</sub> Plan (SJVAPCD 2008)*
- 13 • *Raising the Roof: California Development Projections and Constraints,*  
14 *1997–2020. Statewide Housing Plan Update (HCD 2000)*
- 15 • *California Transportation Plan 2025 (Caltrans 2006)*
- 16 • *Butte County Regional Transportation Plan 2008–2035 (BCAG 2008)*
- 17 • *The Sacramento Area Council of Governments' Metropolitan*  
18 *Transportation Plan/Sustainable Communities Strategy for 2035*  
19 *(SACOG 2011)*
- 20 • *The San Joaquin Council of Governments' 2011 Regional*  
21 *Transportation Plan (SJCOG 2011)*
- 22 • *The Stanislaus Council of Governments' 2011 Regional Transportation*  
23 *Plan (STANCOG 2010)*
- 24 • *The Merced County Association of Governments' 2012 Regional*  
25 *Transportation Improvement Program (MCAG 2011)*
- 26 • *Madera County 2011 Regional Transportation Plan (Madera County*  
27 *2011)*
- 28 • *The Council of Fresno County Governments' 2011 Regional*  
29 *Transportation Plan (Council of Fresno County Governments 2010)*

- 1 • *Natomas Basin Habitat Conservation Plan* (City of Sacramento et al.  
2 2003)
- 3 • *East Contra Costa County Habitat Conservation Plan/Natural*  
4 *Community Conservation Plan* (East Contra Costa County HCPA  
5 2006)
- 6 • *San Joaquin County Multi-Species Habitat Conservation and Open*  
7 *Space Plan* (San Joaquin County 2000)
- 8 • *Bay Delta Conservation Plan* (Reclamation et al. 2012)
- 9 • The Delta Stewardship Council's *Delta Plan* (Delta Stewardship  
10 Council 2011)
- 11 • The Delta Protection Commission's *Land Use and Resource*  
12 *Management Plan for the Primary Zone of the Delta* (DPC 2010)
- 13 • The Delta Protection Commission's *Economic Sustainability Plan for*  
14 *the Sacramento–San Joaquin Delta* (DPC 2011)
- 15 • The Sacramento–San Joaquin Delta Conservancy's *Interim Strategic*  
16 *Plan* (Delta Conservancy 2011)
- 17 • *Yolo Natural Heritage Program Plan Document* (Yolo County  
18 HCP/NCCP JPA 2011)
- 19 • *Butte Regional Conservation Plan* (BCAG 2011)

20 Also, in July 2000, a final programmatic environmental impact statement/  
21 environmental impact report was prepared for the CALFED Bay-Delta  
22 Program (CALFED FEIS/R). The CALFED FEIS/R addresses a broad  
23 range of ecosystem quality, water supply, water quality, and levee system  
24 integrity issues, with a focus on the San Francisco Bay/Sacramento–San  
25 Joaquin Delta (Delta) system but also with broader consideration of  
26 upstream areas in the Sacramento and San Joaquin river drainages. The  
27 CALFED FEIS/R therefore reflects a broad cumulative assessment of  
28 potential projects and impacts in the Systemwide Planning Area (SPA), and  
29 has been incorporated by reference for this and other purposes. See Section  
30 1.5, “Relationship to Other EIRs,” in Chapter 1.0, “Introduction.”

31 Impacts of the proposed program could also cumulate with those resulting  
32 from broad patterns of residential, commercial, industrial, institutional, and  
33 other developments within the SPA. Generally, these developments are  
34 governed by city and county general plans, specific plans, and zoning

1 ordinances, or other plans of specialized government entities such as the  
2 master plans prepared for campuses of California State University. These  
3 plans have generally been supported by environmental analysis under  
4 CEQA, typically in the form of PEIRs. Many of these plans and EIRs  
5 include measures to address program-level and cumulative impacts.  
6 However, these plans generally do not estimate specific development  
7 levels, but instead provide a broad framework to guide future development.  
8 Actual development levels will be strongly affected by factors such as  
9 population growth, the availability of government funds, future  
10 discretionary decisions, and the status of the economy. Further, given the  
11 broad geographic scope of the SPA, detailed consideration of each of these  
12 plan documents would be infeasible.

13 Instead, this PEIR relies on a geographic information system (GIS)–based  
14 assessment of the anticipated scope and nature of those future development  
15 levels and patterns. David Theobald of Colorado State University led  
16 compilation of a GIS database showing existing and projected future  
17 housing densities in the U.S. (Theobald 2005). This nationwide database  
18 can be used to focus on conditions in a particular state or region down to  
19 the level of Census Blocks (Census blocks are bounded by physical  
20 features or political boundaries, and range in size from a city block to  
21 several square miles in rural areas.). Information from this database for the  
22 program study area is shown in Figures 4.3-1a and 4.3-1b. The figures  
23 show housing density based on 2000 census data and projected future  
24 housing densities in 2020 based on the Spatially Explicit Regional Growth  
25 Model (SERGoM) developed by Mr. Theobald. This model estimates  
26 future housing density in particular areas based on projected population  
27 growth in local areas, local data on persons per household, travel time to  
28 the nearest urban core, locations of transportation corridors, and locations  
29 of protected lands where development would not be permitted. Housing  
30 density is expressed using five categories from greater to lesser density;  
31 Urban Suburban, Exurban, Rural, Undeveloped Private, and Public and/or  
32 Protected Land. Data from the 1990 and 2000 census' was entered into the  
33 model to assess its predictive accuracy, with good results. Housing density  
34 indicates the overall level of human influence and is associated with factors  
35 such as the extent of roads, demand for utilities and services, hydrologic  
36 alteration, habitat modification and fragmentation, and human disturbance.  
37 The projected future housing densities for 2020 are an indicator of future  
38 development projects that provide a context for the cumulative analysis. As  
39 shown in Figures 4.3-1a and 4.3-1b, future housing development would be  
40 greatest near existing urban development and along major transportation  
41 corridors.



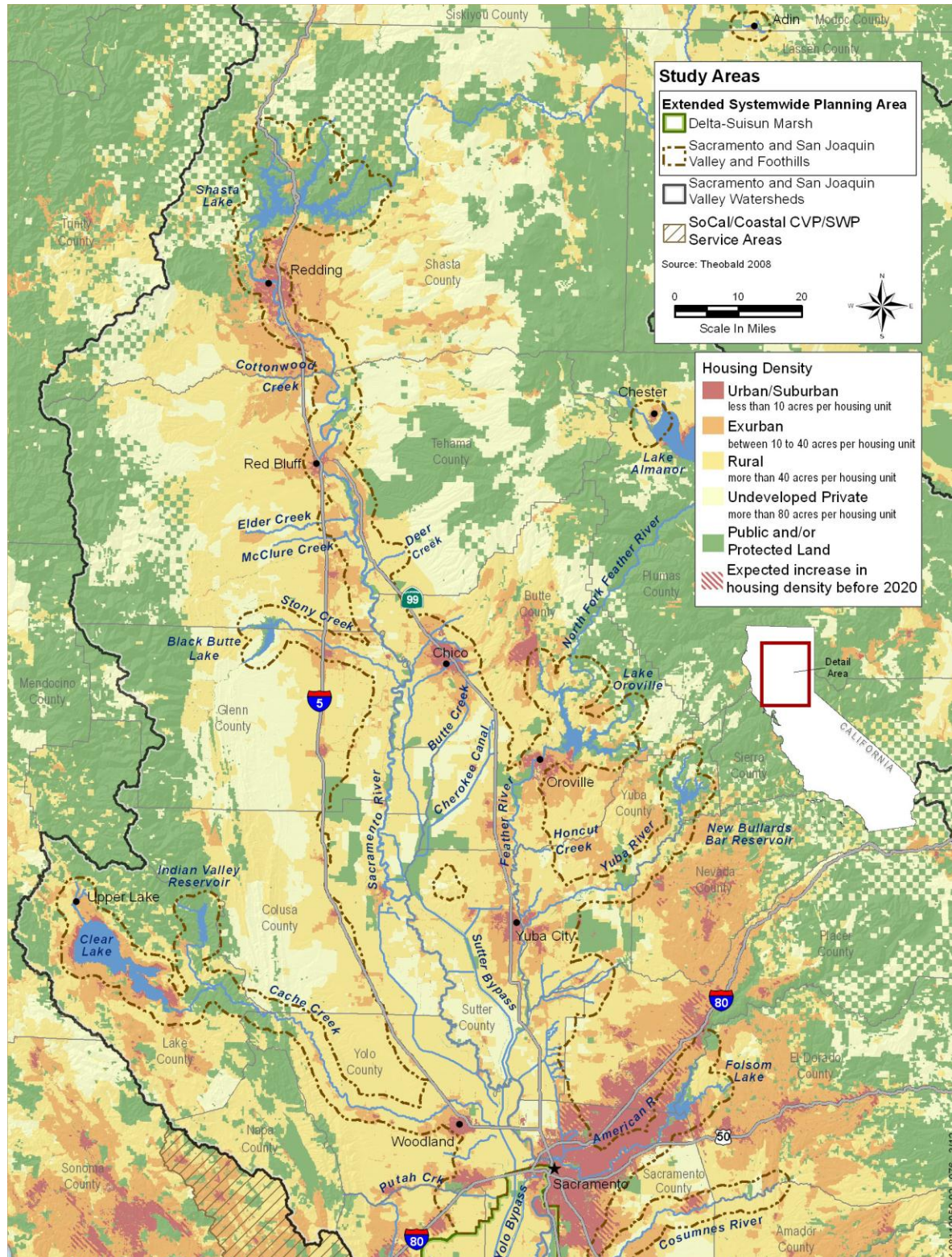
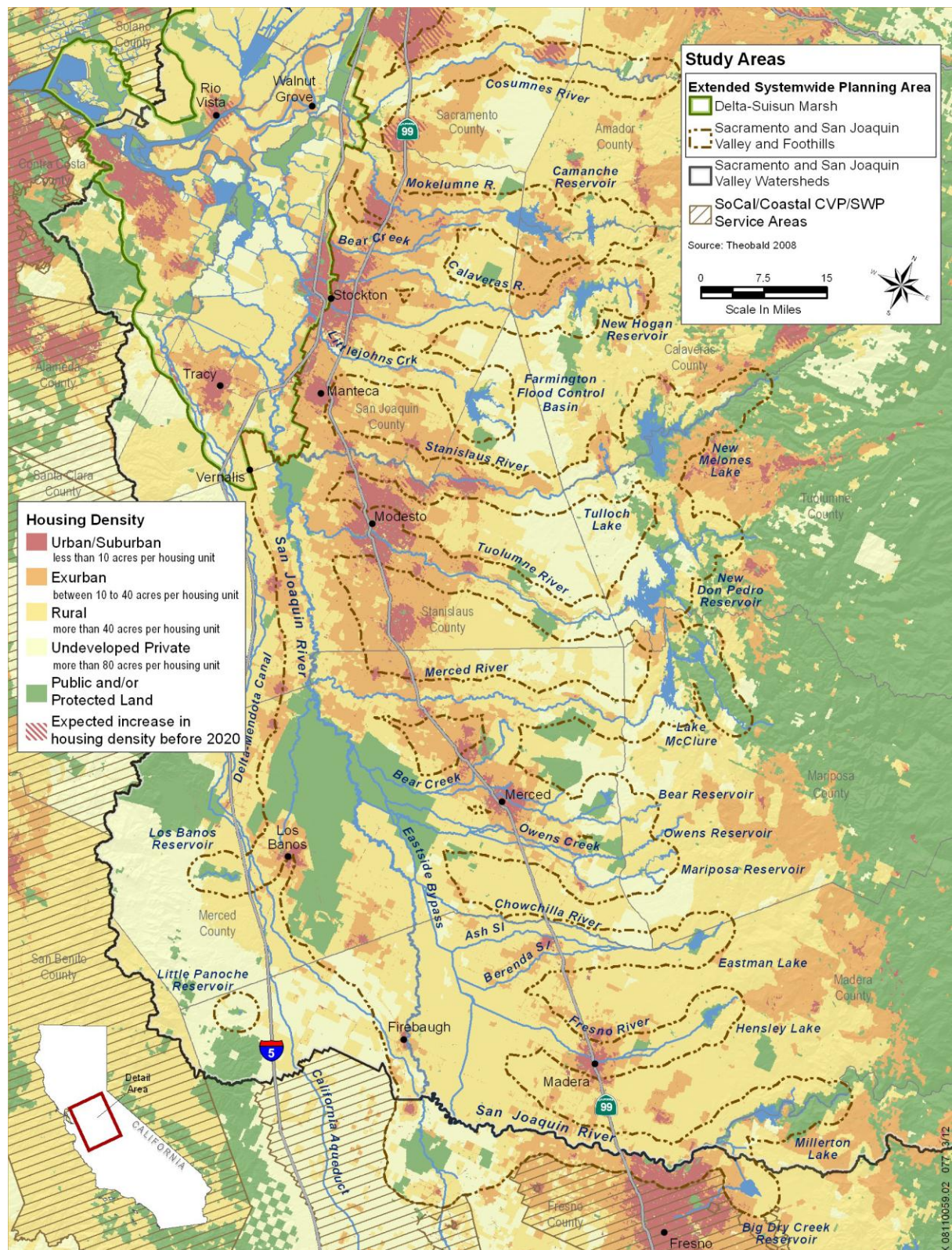


Figure 4.3-1a. Housing Density—North



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**Figure 4.3-1b. Housing Density—South**

### ***List of Reasonably Foreseeable Probable Future Projects***

In addition to the statewide, regional, and local plans and statewide development data identified in the previous section, reasonably foreseeable future flood management and water supply management projects in the extended systemwide planning area (Extended SPA) are included in this cumulative impacts analysis. These projects were considered individually because their effects are more closely related to those of the CVFPP than other projects. This list of projects does not include any project that would be included as part of the CVFPP if the CVFPP were adopted.

Each future project considered for this cumulative impacts analysis is located in the Extended SPA and could have an effect on a portion of the physical environment that also could be affected by the CVFPP (i.e., the project may interact with the CVFPP on a cumulative basis). A list of potential reasonably foreseeable future projects was developed using available information regarding planned projects (including agency Web sites).

Potential reasonably foreseeable future projects were evaluated for inclusion in the cumulative effects analysis based on three criteria. To be considered reasonably foreseeable and included in the cumulative impact analysis, the future project must generally meet all of the following criteria:

1. The project is related to the CVFPP; that is, it would affect CVFPP-affected resources (i.e., interact on a cumulative basis with the CVFPP).
2. Sufficiently detailed information about the project is available to allow meaningful analysis without undue speculation.
3. The project is actively under development (i.e., an identified sponsor is actively pursuing project development or construction); initial CEQA and/or National Environmental Policy Act (NEPA) compliance documents, such as a draft EIR or environmental impact statement, have been completed or substantial progress has been made toward completion; and the project is “reasonably foreseeable” given other considerations, such as site suitability, funding and economic viability, and regulatory limitations.
4. The project would not be considered to be part of the CVFPP if the CVFPP were adopted.

Projects that would be considered to be part of the CVFPP were not included in the list of future projects because environmental impacts of the CVFPP are already described in Chapter 3.0 of this PEIR. To consider the impacts of a project both on a project-specific basis and as a separate,

1 reasonably foreseeable future project would in effect “double count” the  
2 impacts.

3 Only projects meeting all four of the criteria described above were included  
4 in the analysis of cumulative impacts as reasonably foreseeable projects.  
5 The following projects have been considered:

- 6 • Yuba River Basin Project
- 7 • Shasta Lake Water Resources Investigation
- 8 • North of Delta Off-Stream Storage (Sites Reservoir)
- 9 • Los Vaqueros Reservoir Expansion
- 10 • Arroyo Pasajero Flood Related Improvements (CVP/SWP)
- 11 • San Joaquin River Salinity Management Plan
- 12 • Cosgrove Creek Flood Control Project
- 13 • San Joaquin River Restoration Program
- 14 • North Delta Flood Control and Ecosystem Restoration Project
- 15 • Dutch Slough Tidal Restoration Project
- 16 • Franks Tract Project
- 17 • Delta-Mendota Canal/California Aqueduct Intertie Project
- 18 • Delta Water Supply Project
- 19 • Hetch Hetchy Seismic Upgrade Project
- 20 • North Bay Aqueduct Alternative Intake Project
- 21 • BDCP/DHCCP/Delta Plan
- 22 • Suisun Marsh Management, Preservation, and Restoration Plan



## 4.4 Cumulative Impacts Methodology and Analysis

### 4.4.1 Methods and Assumptions

Determining the significance of a project's cumulative impacts is a two-step process. First, the extent of the cumulative impacts without the proposed program must be evaluated to determine whether a significant cumulative impact on a resource would exist in the future. To do so, a lead agency must examine the combined effects of past, present, and probable future projects to determine whether a significant cumulative impact would occur. Second, the lead agency must determine whether the project's incremental contribution to any significant cumulative impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

Consistent with Section 15064(h)(3) of the CEQA Guidelines, however, if a project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the significant cumulative impact, the project's incremental contribution to that significant cumulative impact might not be cumulatively considerable. In addition, as stated in Section 15064(h)(4) of the CEQA Guidelines, the existence of a significant cumulative impact caused by other projects alone shall not constitute substantial evidence that the incremental effects of a proposed project are cumulatively considerable.

For each issue area addressed in this PEIR, the criteria applied to evaluate the significance of the overall cumulative effect are the same criteria used to evaluate direct and indirect impacts for that issue area.

### 4.4.2 Cumulative Impacts

#### ***Aesthetics***

Cumulative impacts on aesthetic resources would occur in the Extended SPA and, to a lesser extent, in the Sacramento and San Joaquin Valley watersheds; the aesthetic resources within these areas are described in detail in Section 3.2, "Aesthetics." The Sacramento and San Joaquin Valley and foothills consist of a band of rolling hills cut by steep-sided canyons at the base of the Sierra Nevada and Coast Ranges, transitioning to the relatively flat valley floor. The Delta is a vast, interconnected network of streams and rivers, with islands surrounded by levees and rural towns.

1 Urbanization occurs along the major highways within the Sacramento and  
2 San Joaquin Valley, primarily along Interstates 5 and 80 and State Routes  
3 70 and 99. In the Delta, most of the urbanized development occurs on the  
4 periphery of this geographic area in Sacramento, San Joaquin, and Contra  
5 Costa counties. Development is increasingly changing the visual character  
6 of the study area from vast areas of open space to urban uses, thus altering  
7 and limiting the views available to recreationists and area residents. This  
8 trend will continue as reasonably foreseeable probable future projects are  
9 implemented in the study area. Visual conditions will continue to change  
10 substantially as agricultural lands and open space are replaced by urban and  
11 industrial development and infrastructure projects, and as vegetation is  
12 removed to make room for future development. As urban development  
13 increases, nighttime light and glare and the subsequent skyglow will also  
14 increase, and views of the night sky will become more limited. The effect  
15 on aesthetic resources that would result from these changes associated with  
16 past, present, and planned future projects would be a cumulatively  
17 significant impact.

18 The flood control facilities that are most visible in the study area are the  
19 levees located along the Sacramento and San Joaquin rivers and their  
20 tributaries and in the Delta. Numerous hydroelectric facilities operate at  
21 reservoirs in the foothills. These facilities consist of dams, penstocks,  
22 powerhouses, and high-voltage transmission lines and towers. The  
23 transmission lines are distributed throughout the Extended SPA, primarily  
24 in the Central Valley.

25 Overall, implementing conveyance-related near-term management  
26 activities (NTMAs) and long-term management activities (LTMAs) would  
27 not cause substantial, localized changes to the existing visual character of  
28 the Extended SPA. In urban settings, where the largest number of sensitive  
29 viewers would be expected, the existing levee system would typically be  
30 repaired, reconstructed, or otherwise improved in place. The conveyance-  
31 related NTMAs and LTMAAs with the greatest potential to alter visual  
32 conditions (e.g., new facilities) would be implemented in rural areas where  
33 there are few sensitive viewers and flood control structures are common  
34 visual features, and the visual character of levees and other conveyance-  
35 related flood control facilities would generally be consistent with current  
36 conditions. Any new flood control facilities would generally be consistent  
37 in size and form with the existing structure; for example, a replacement  
38 pumping station built along the alignment of a setback levee would be  
39 similar to the existing pumping station along the levee segment to be  
40 removed. Therefore, implementing the proposed program's conveyance-  
41 related activities would not result in a cumulatively considerable  
42 incremental contribution to a significant cumulative impact related to the

1 substantial degradation of scenic vistas, scenic resources, and existing  
2 visual character.

3 Increased drawdown resulting from changes in reservoir operations would  
4 lower water levels, which might cause a greater area of shoreline to be  
5 exposed, thereby reducing the visual character of the surrounding area.  
6 However, the additional drawdown associated with NTMAs would be  
7 comparable to existing seasonal variations, the fluctuations in reservoir  
8 water levels would not vary substantially from year to year, and the  
9 fluctuations would cause relatively minor changes in surface water  
10 elevations. Therefore, implementing the proposed program's storage-  
11 related activities would not result in a cumulatively considerable  
12 incremental contribution to a significant cumulative impact related to the  
13 substantial degradation of scenic vistas, scenic resources, and existing  
14 visual character.

15 NTMAs and LTMAAs could involve constructing small additional facilities  
16 such as pumping stations that could include lighting and building materials  
17 that could cause glare. Introducing new long-term or permanent sources of  
18 light and glare in areas where artificial lighting is currently limited or  
19 nonexistent could adversely affect daytime or nighttime views.  
20 Implementing a lighting plan and requiring conformance with lighting  
21 standards (Mitigation Measure VIS-4 (NTMA and LTMA)) would reduce  
22 this potentially significant impact to a less-than-significant level. These  
23 types of light and glare impacts occur over a limited area. It would be  
24 highly unlikely that NTMA and LTMA projects would generate light and  
25 glare of sufficient intensity to interact with light and glare generated by  
26 other projects in a manner that would result in a significant cumulative  
27 impact. Therefore, the proposed program would not result in a  
28 cumulatively considerable incremental contribution to a significant  
29 cumulative impact related to new sources of substantial light and glare.

30 Other NTMAs and LTMAAs would include implementation of a vegetation  
31 management strategy (VMS). As part of this strategy, levee-maintaining  
32 agencies would implement a vegetation life-cycle management plan that  
33 would result in gradual thinning or removal of mature riparian vegetation in  
34 some areas. The loss of trees and woody vegetation that would result from  
35 implementing other NTMAs and LTMAAs would not substantially adversely  
36 affect the visual character. Many of the other management activities would  
37 occur in rural areas where there would be few sensitive viewers. In  
38 addition, sensitive viewers would gradually become accustomed to changes  
39 in the visual character; the loss of trees and woody vegetation would occur  
40 slowly over multiple decades, one tree at a time, and vegetation would be  
41 replaced in many locations with implementation of the VMS and  
42 conservation elements. Therefore, implementing the proposed program's

1 other management activities would not result in a cumulatively  
2 considerable incremental contribution to a significant cumulative impact  
3 related to the substantial degradation of scenic vistas, scenic resources, and  
4 existing visual character.

#### 5 ***Agriculture and Forestry Resources***

6 Cumulative impacts on agriculture and forestry resources would occur in  
7 the Extended SPA and, to a lesser extent, in the Sacramento and San  
8 Joaquin Valley watersheds. Section 3.3, “Agriculture and Forestry  
9 Resources,” describes agricultural land uses in the study area, as well as  
10 riparian forest as it relates to potential conversion of forest land to  
11 nonforest uses. A detailed description of riparian forest habitat is presented  
12 in Section 3.6, “Biological Resources—Terrestrial.”

13 Without implementation of the CVFPP, the significant cumulative losses of  
14 agricultural resources, including Important Farmland (Prime Farmland,  
15 Unique Farmland, or Farmland of Statewide Importance), and of forestry  
16 resources that have occurred in the Extended SPA from past projects—and  
17 that would continue as a result of planned future projects in the study  
18 area—are considered a cumulatively considerable (i.e., significant) impact.

19 **Agricultural Resources** In 2008, the California Department of  
20 Conservation estimated that California had approximately 31.6 million  
21 acres of agricultural land, identifying approximately 12.4 million acres as  
22 Important Farmland and 19.2 million acres as Grazing Land. During the 12  
23 biennial reporting cycles since the Farmland Mapping and Monitoring  
24 Program was established, more than 1.3 million acres of agricultural land in  
25 California have been converted to nonagricultural purposes. Urbanization  
26 has resulted in substantial loss of agricultural land in the state. Housing  
27 developments are the most frequent and largest category of newly  
28 urbanized land. The increase is associated mostly with single-family homes  
29 located at the periphery of existing cities, and to a lesser degree, with  
30 apartment complexes.

31 In addition to conversion to urban or other land uses (e.g., habitat  
32 restoration), other factors affect the acreage of irrigated farmland.  
33 Regionally, factors related to the availability and reliability of surface water  
34 and groundwater supplies, crop markets, and anticipation of urban  
35 development affect the acreage of irrigated farmland. More locally,  
36 changes in annual water supplies, drainage, access, and compatibility with  
37 adjacent land uses also affect the productivity and value, and thus use, of  
38 agricultural land.

39 Future implementation of development projects anticipated in city and  
40 county general plans and other flood control projects considered in this



cumulative analysis would further convert Important Farmland to nonagricultural uses. Often, conversions of Important Farmland, whether from past, present, or future projects, also result in conversions of land under Williamson Act contracts to uses inconsistent with the contracts and contract cancellations. Given these conditions, a significant cumulative impact exists relative to agricultural resources, without the contribution of impacts from the proposed program.

Construction activities associated with the proposed program would directly and indirectly affect lands classified as Important Farmland and lands under Williamson Act contracts. Construction-related activities would involve developing temporary facilities such as staging areas, access haul roads, and borrow sites. Implementing NTMAs and LTMAAs could directly and permanently convert Important Farmland to nonagricultural uses—namely, flood control facilities. Where these activities would require modifying existing levee footprints or constructing new flood control facilities (i.e., new levees, weirs, or bypasses), they could also cause Williamson Act contracts to be cancelled.

Agricultural lands that are classified as Important Farmland or under Williamson Act contracts could be indirectly converted to nonagricultural uses where NTMAs and LTMAAs would transect agricultural properties. If this were to occur, agricultural parcels could be fragmented, be reduced in size, or become irregularly shaped to such a degree as to make continuing agricultural land uses difficult or infeasible.

Other NTMAs and LTMAAs may place agricultural lands in the expanded floodway, potentially rendering them no longer suitable for agricultural production (depending on factors such as crop type) because they would be inundated during high-water events. Regular inundation from placing the land in the expanded floodway may make agricultural production no longer feasible and the land could be converted to another use (e.g., habitat restoration). In addition, integrating environmental conservation elements into implementation actions may require agricultural land to support such actions, and implementing these elements would require that this land be converted to nonagricultural uses.

Operational changes to reservoir releases under NTMAs and LTMAAs would result in only minor changes in downstream river flows. Flood flows would be comparable to the periodic flood flows that have occurred historically and would not be sufficient to alter the suitability of existing agricultural lands for continued agricultural production. The impact of converting Important Farmland to nonagricultural uses or cancelling Williamson Act contracts as a result of changes in the timing, magnitude, or frequency of flood releases under NTMAs and LTMAAs would be less

1 than significant. The acreages of Important Farmland and land under  
2 Williamson Act contracts that may be directly and indirectly converted to  
3 nonagricultural uses from implementation of conveyance-related or other  
4 NTMAs and LTMA s cannot be quantified at this time; however, it is  
5 reasonable to assume that such conversions would occur during  
6 implementation of the CVFPP. Therefore, this impact would be significant.  
7 Implementing Mitigation Measures AG-1a (NTMA), AG-1b (NTMA),  
8 AG-1 (LTMA), AG-2a (LTMA), AG-2b (LTMA), and AG-3 (NTMA and  
9 LTMA) would preserve the agricultural productivity of Important  
10 Farmland to the extent possible and minimize impacts on Williamson Act–  
11 contracted lands. Implementing these mitigation measures would reduce  
12 impacts, but not to a less-than-significant level. For both NTMAs and  
13 LTMA s, impacts of conveyance-related and other management activities  
14 related to conversion of Important Farmland to nonagricultural uses and  
15 conversion of Williamson Act lands to uses inconsistent with the contracts  
16 would be significant and unavoidable.

17 Implementing Mitigation Measures AG-1a (NTMA), AG-1b (LTMA), AG-  
18 2a (LTMA), AG-2b (LTMA), and AG-3 (NTMA and LTMA) would  
19 substantially lessen the proposed program's incremental contribution to any  
20 significant cumulative impacts associated with conversion of Important  
21 Farmland and lands under Williamson Act contract. Continued agricultural  
22 land uses would be encouraged where possible and conservation easements  
23 would be acquired to replace agricultural lands converted to nonagricultural  
24 uses. These measures would lessen significant impacts associated with  
25 conversion of agricultural land uses because funding conservation  
26 easements would assist the public and private sectors in protecting other  
27 farmland from the pressures of development. However, the easements are  
28 often purchased for land that exhibits benefits to wildlife, including a  
29 combination of habitat, open space, and agricultural lands; therefore, the  
30 compensation provided by the fee contribution would not necessarily be  
31 applied exclusively to agricultural lands. In addition, it is likely that  
32 conservation easements would not provide new farmland and the  
33 productivity of existing farmland would not be improved as a result of the  
34 conservation easements. Consequently, full compensation for losses of  
35 farmland would not be achieved and a net loss of Important Farmland  
36 would still occur.

37 Given the size and geographic scope of the proposed program, and the  
38 inability to ensure full mitigation of impacts on agricultural resources to  
39 less-than-significant levels, the proposed program is considered to result in  
40 a cumulatively significant incremental contribution to the existing  
41 significant cumulative impact on agricultural resources.

**Forestry Resources** The following discussion focuses on riparian forest because this is the category of forestland expected to be the most affected by activities under the proposed program. Other types of forestland, such as oak woodland and conifer forest, could be affected by NTMAs and LTMA; however, effects on these forestland types are less likely, and the extent of such effects would be less than effects on riparian forest. Past actions by humans have substantially changed riparian forest compared with historical conditions. Large areas of native riparian forest in the study area have been lost or degraded in the past 150 years. Most of these losses have resulted from constructing facilities for federal and State water projects and modifying flow patterns below dams, particularly through channelization, and then clearing or filling behind levees for the conversion to agricultural and urban land uses. These changes have resulted in overall significant cumulative adverse effects on the extent, species composition, and function of riparian forestlands. A detailed analysis of the potential cumulative effects of the proposed program on riparian forestlands is presented below under “Biological Resources—Terrestrial.”

However, as identified in Section 3.3, “Agriculture and Forestry Resources,” implementing conveyance-related and other NTMAs and LTMA (i.e., implementing the VMS) would result in significant impacts related to the conversion of forestland to nonforest uses. Implementing Mitigation Measures AG-4 and AG-6 (NTMA and LTMA) would reduce these impacts to a less-than-significant level because the project proponent would replace lost forestland with equal amounts of forestland through habitat restoration, creation, or enhancement. With mitigation, conveyance-related and other activities under the proposed program would not result in a net reduction in the extent of riparian forest in the study area. Therefore, the proposed program’s conveyance-related and other management activities would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to the conversion of forestland to nonforest uses.

Reoperating water storage facilities under the NTMAs and LTMA may alter the frequency and duration of inundation of some patches of riparian vegetation. Surface water levels above and below existing dams would fluctuate if water storage facilities were reoperated. Although surface water levels could change from existing conditions at specific times of year, they would not be likely to vary substantially and would be expected to remain within historical fluctuation levels. These small changes in surface water levels would not result in the loss of riparian forest. Therefore, the proposed program’s storage-related management activities would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to the conversion of forestland to nonforest uses.

1 It should be noted that ultimately, implementing the CVFPP Conservation  
2 Strategy Framework could result in a net increase in riparian forest in the  
3 program study area, which would assist in mitigating the cumulatively  
4 significant loss of riparian forest from past, present, and future projects.

#### 5 ***Air Quality***

6 Cumulative effects on air quality could occur at the local, regional, and  
7 state levels. Local and regional air districts are responsible for maintaining  
8 air quality within their jurisdictions to maintain and attain ambient air  
9 quality standards. The air quality plans and emissions inventories  
10 developed at the local and regional levels are incorporated into the State  
11 Implementation Plan, which demonstrates the State's ability to achieve and  
12 maintain ambient air quality standards. Therefore, significant emissions of  
13 a project or program that are not already included in the emissions  
14 inventories supporting those plans could affect local and regional efforts to  
15 achieve and maintain ambient air quality standards, which could in turn  
16 cumulatively contribute to impeding attainment of State air quality  
17 objectives.

18 The Extended SPA and the Sacramento and San Joaquin Valley watersheds  
19 are located in several air basins: the Sacramento Valley, Lake County,  
20 Mountain Counties, San Joaquin Valley, San Francisco Bay Area, Great  
21 Basin Valleys, and Northeast Plateau air basins. These air basins in the  
22 Extended SPA and the Sacramento and San Joaquin Valley watersheds are  
23 in nonattainment for various pollutants (see Figures 3.4-2 and 3.4-3 in  
24 Section 3.4, "Air Quality," for the attainment status of air basins in this  
25 area). The nonattainment status indicates that various past and present  
26 projects have combined to result in a significant adverse cumulative air  
27 quality impact for the nonattainment pollutant in the air basin. Revisions of  
28 the applicable air quality plans to address these nonattainment problems are  
29 regularly being prepared by the local air quality management districts for  
30 submission to the California Air Resources Board and the U.S.  
31 Environmental Protection Agency. However, the nonattainment problem in  
32 much of the Central Valley has proven challenging, particularly with regard  
33 to ozone and fine particulates, and this analysis assumes that the  
34 nonattainment situation will continue, resulting in a significant long-term  
35 cumulative impact.

36 The construction-related, operational, and maintenance-related activities  
37 associated with the NTMAs and LTMAAs would generate project-specific  
38 emissions of criteria air pollutants, toxic air contaminants (TACs), and  
39 odors within the Extended SPA and Sacramento and San Joaquin Valley  
40 watersheds. The cumulative effects at the local, regional, and State levels  
41 are discussed in this section.

Because of the lack of available details about construction-related and operational activities under the proposed program, construction emissions associated with the proposed program were evaluated by comparing other similar construction projects that have occurred in the Extended SPA and the Sacramento and San Joaquin Valley watersheds with the applicable significance thresholds. These similar projects are the Reclamation District 17 Levee Improvement Project and the Feather River Levee Repair Project.

**Short-Term Construction Impacts** Construction under the proposed NTMAs and LTMAAs would result in temporary emissions of reactive organic gases, oxides of nitrogen, carbon monoxide, oxides of sulfur, and respirable and fine particulate matter with aerodynamic resistance diameters of 10 and 2.5 micrometers or less (the latter commonly known as PM<sub>10</sub> and PM<sub>2.5</sub>). These emissions would occur intermittently and at varying intensities depending on the daily construction activities. The construction intensity required, locations of construction activities, and duration of construction are unknown for the proposed conveyance, storage, and other management actions; therefore, the emissions associated with these actions cannot be accurately quantified or compared with a threshold of significance at the time of this writing.

However, the example construction projects listed above, which are comparable to many of the proposed program's anticipated actions in terms of construction intensity and location, generated emissions that exceeded some of the applicable thresholds of significance. In addition, because the proposed program's management activities would occur in some of the same air districts as the example projects, the proposed program's construction emissions would be likely to exceed applicable significance thresholds. Although the program's construction emissions may be accounted for in the emissions inventories of the applicable air quality plans, those plans generally do not identify the projects assumed to contribute to overall inventory levels. Instead, the emissions inventories generally consist of broad categories, such as off-road motor vehicles, without further specification. The total construction emissions anticipated under the program are estimated to compose a small fraction of the overall emissions inventories in the applicable air quality plans. However, given the uncertainty regarding the scale of those emissions and the inability to determine whether those emissions have been accounted for in the plan inventories, this analysis conservatively assumes that program construction emissions could hamper maintenance or attainment of ambient air quality standards.

Some quantity of NTMA- and LTMA-related construction emissions in the same air district could be offset by flood avoidance benefits, but this offset cannot be assured to have a nexus to the identified impacts, either

1 temporally or geographically. Therefore, the overall incremental impact  
2 relative to existing conditions would be potentially significant, though only  
3 temporary in duration. Implementing Mitigation Measure AQ-1 (NTMA  
4 and LTMA) would reduce the impact of emissions from construction  
5 activities; however, the extent to which emissions would be reduced is  
6 unknown. Because of the uncertainty about proposed construction activities  
7 (duration, intensity, and location) and subsequent mitigation requirements,  
8 it is not possible at the time of this writing to know whether the emissions  
9 associated with constructing management actions would be reduced below  
10 the established thresholds. Consequently, construction-related impacts  
11 related to air pollutant emissions would be potentially significant and  
12 unavoidable, though only temporary in duration.

13 Assuming that all related projects would also implement all feasible  
14 construction emission control measures, construction emissions from some  
15 of the related projects may be less than significant; however, it is likely that  
16 at least some larger projects would result in potentially significant and  
17 unavoidable air quality impacts on their own. Because the proposed  
18 program would result in significant and unavoidable impacts related to  
19 emissions of nonattainment pollutants (e.g., ozone precursors, PM<sub>10</sub>, and  
20 PM<sub>2.5</sub>), the proposed program would be considered to result in a  
21 cumulatively considerable incremental contribution to a significant  
22 cumulative impact, though only temporary in duration.

23 The proposed program also has the potential to contribute to a cumulative  
24 localized air quality impact such as emissions of TACs, presence of  
25 naturally occurring asbestos (NOA), or emissions of odors. Construction of  
26 the proposed management activities would involve using heavy-duty  
27 diesel-fueled equipment that generate diesel particulate matter (diesel PM),  
28 which is classified as a TAC by the California Air Resources Board. It is  
29 anticipated that construction activities would be intermittent and temporary  
30 and would not occur over large geographic areas. Therefore, impacts  
31 associated with construction-related diesel PM emissions would be less  
32 than significant.

33 For a cumulative impact related to TAC emissions to be significant, an  
34 interaction must occur between the emission source and nearby exposed  
35 receptors. The situations in which numerous receptors might be exposed to  
36 diesel PM from multiple sources, thereby potentially generating a  
37 significant cumulative impact, could occur in urban settings. NTMAs and  
38 LTMAAs would be relatively modest in urban settings, primarily involving  
39 repair, reconstruction, and improvement of existing levees and other flood  
40 control facilities. In these instances, construction would be short term and  
41 would be highly unlikely to make a cumulatively considerable incremental  
42 contribution to a significant cumulative impact related to diesel PM

1 exposure. Larger scale NTMAs and LTMA's with proportionately greater  
2 diesel PM emissions would be implemented in rural settings, where it is  
3 highly unlikely that there would be significant additional diesel PM  
4 emission sources near sensitive receptors. The diesel PM emissions from  
5 NTMAs and LTMA's would be less than significant on a project-specific  
6 basis, and the related projects would also not result in appreciable diesel  
7 PM exposure at the same sensitive receptors. Therefore, it is highly  
8 unlikely that a significant cumulative impact related to diesel PM would  
9 occur, and the proposed program would not make a cumulatively  
10 considerable incremental contribution to a significant cumulative impact  
11 related to diesel PM exposure.

12 NOA has been found in regions where the proposed program could  
13 potentially perform earth-disturbing activities. If soil containing NOA were  
14 to be disturbed during construction, construction employees and nearby  
15 sensitive receptors could be exposed to NOA. Implementing Mitigation  
16 Measure AQ-6 (NTMA and LTMA) would reduce this potentially  
17 significant impact to a less-than-significant level on a project-specific basis  
18 by requiring that all construction activities comply with the California Air  
19 Resources Board's Asbestos Air Toxic Control Measure for Construction,  
20 Grading, Quarrying, and Surface Mining Operations, which was designed  
21 to minimize exposure of construction workers and nearby sensitive  
22 receptors to NOA. In addition, all of the related projects that would occur  
23 within areas known to have NOA would be required to comply with the  
24 same air toxic control measure and any other locally applicable  
25 requirements for NOA management. Therefore, a significant cumulative  
26 impact is not expected to occur, and the proposed program would not result  
27 in a cumulatively considerable incremental contribution to a significant  
28 cumulative impact related to NOA.

29 Construction activities could also generate odor impacts from emissions of  
30 diesel exhaust. In large concentrations, diesel exhaust could cause a  
31 nuisance and odor impact. It is not anticipated that the proposed program's  
32 construction-related activities would individually generate odor impacts  
33 due to the intermittent activities and highly dispersive nature of diesel  
34 exhaust. Odor sources very seldom interact in an additive nature that results  
35 in a significant cumulative impact. Normally, there is a primary source of  
36 objectionable odors and attention focuses on this source. If another source  
37 of objectionable odors exists, it is often perceived as being a separate, less  
38 intense odor than the primary source, and not additive to the primary  
39 source. If a substantial number of sensitive receptors were already exposed  
40 to an objectionable source of odors, it is highly unlikely that the temporary  
41 and intermittent addition of diesel exhaust would be perceived as  
42 contributing substantially to the experience of objectionable odors in the  
43 area. In addition, diesel exhaust is highly dispersive; the odor rapidly

1 dissipates with distance. Any diesel exhaust odors generated by  
2 construction under the proposed program would not affect a substantial  
3 number of receptors. Therefore, implementing the proposed program would  
4 not result in a cumulatively considerable incremental contribution to a  
5 significant cumulative impact related to odors.

6 **Long-Term Operational and Maintenance Impacts** After construction  
7 of the proposed program's components, long-term operational emissions  
8 would be generated by operation and maintenance of program  
9 infrastructure. The net change to existing operational and maintenance-  
10 related activities from implementing NTMAs and many LTMAAs is  
11 expected to be minimal; most activities would involve repairing,  
12 reconstructing, or improving the existing facilities, and then continuing the  
13 operations and maintenance practices already in place before the NTMAs  
14 or LTMAAs were implemented. Alterations to operations of existing  
15 reservoirs included in the proposed program would have little effect on  
16 actual operation and maintenance efforts and associated emissions, because  
17 the modifications would only alter the timing of activities that already take  
18 place (e.g., initiating and terminating reservoir releases). Accordingly,  
19 these management activities would not emit a cumulatively considerable  
20 amount of criteria air pollutants or ozone precursors for which the  
21 applicable project region is nonattainment.

22 LTMAAs could involve constructing and operating new facilities such as  
23 flood bypasses and levees. Operating and maintaining these facilities could  
24 potentially result in substantial new sources of emissions. The extent of  
25 emissions resulting from operation and maintenance of these facilities is  
26 highly dependent on factors such as the facility's location, size, and  
27 components. For example, the length of vehicle trips needed for  
28 maintenance staff to reach the facilities would influence total emissions.  
29 When anticipated emissions from LTMAAs are combined with emissions  
30 from other reasonably foreseeable, probable future projects, it is possible  
31 that long-term operational emissions would exceed an applicable  
32 significance threshold established by an air district in the study area.

33 Operational activities would occur in the same nonattainment areas  
34 described above for construction; therefore, operational emissions could  
35 contribute to an increase in regional emissions that could conflict with the  
36 budget used for regional air quality planning. Although implementing  
37 Mitigation Measures AQ-3 (LTMA) and AQ-4 (LTMA) would reduce  
38 operational emissions, the extent of the reduction is unknown. Because of  
39 the uncertainty about proposed operational activities and subsequent  
40 mitigation requirements, it is not possible at the time of this writing to  
41 know whether the emissions associated with operating LTMAAs would be  
42 reduced below the established thresholds. Consequently, until further



project-level analysis is completed, it is assumed that operation and maintenance of the LTMAAs could interfere with the ability of the air districts to achieve or maintain ambient air quality standards. Therefore, operational emissions associated with LTMAAs could result in a cumulatively considerable incremental contribution to a significant cumulative operational and maintenance-related air quality impact.

Operational and maintenance-related activities also have the potential to generate TACs and odors. Considering the minor potential for increases in operational and maintenance activities, low intensity of operational activities (i.e., stationary, mobile, and off-road), the large geographical area in which operational activities would occur, and the highly dispersive nature of diesel PM, operational and maintenance-related NTMAAs and LTMAAs are not anticipated to expose sensitive receptors to substantial concentrations of TACs. In addition, increases in operational and maintenance-related emissions would be associated primarily with new facilities (new bypasses, new levees), which would be located primarily in rural areas with few sensitive receptors and few opportunities for dispersal of TACs and odors between emission sources and receptors.

It is unlikely that the intermittent and low-intensity operational and maintenance-related activities associated with the proposed program, even combined with the related projects, would cause a cumulatively considerable impact related to odors. The highly dispersive nature of diesel exhaust and the short-term nature of many operational and maintenance-related activities (e.g., periodic management of levee vegetation, regular inspection and maintenance of pump equipment) would likely not cumulatively contribute to odor impacts. Therefore, implementing the proposed program would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to emissions of TACs or odors.

### ***Biological Resources—Aquatic***

Nearly all of the potential effects of the proposed program on aquatic biological resources would occur in the Extended SPA; therefore, the Extended SPA is considered the geographic context for the cumulative impact analysis. Section 3.5, “Biological Resources—Aquatic,” provides a detailed discussion of aquatic biological resources within the study area.

Past and present activities by humans have substantially changed aquatic habitats in the Extended SPA compared to historical conditions. These changes have resulted in cumulative adverse impacts on the distribution, abundance, and species composition of native fish assemblages within the Sacramento and San Joaquin Rivers and their tributaries. Numerous factors have contributed to these impacts: substantial alteration of flow regimes

1 and reduction of flows; dewatering of stream reaches; isolation of  
2 floodplains from the river channel by channelization and levee  
3 construction; substantial reductions in the frequency, magnitude, and  
4 duration of floodplain inundation; habitat fragmentation by physical  
5 barriers; creation of false migration pathways by flow diversions;  
6 introduction of nonnative fish species; and poor water quality. Several  
7 species are in decline as a result of these ongoing activities in the study  
8 area: delta smelt, longfin smelt, green sturgeon, Sacramento splittail,  
9 hardhead, Pacific lamprey, river lamprey, Central Valley fall-run and  
10 spring-run Chinook salmon, Sacramento River winter-run Chinook salmon,  
11 and Central Valley steelhead. (See Table 3.5-2 in Section 3.5 of this PEIR  
12 for the locations of habitat for these fish species.) Striped bass, an  
13 important game species, is also in decline. Fisheries management plans and  
14 restoration programs, including the San Joaquin River Restoration Program  
15 and the CALFED Bay-Delta Program's Ecosystem Restoration Program  
16 Plan, have been initiated to offset the negative effects of ongoing activities;  
17 however, many reasonably foreseeable future projects would be expected  
18 to contribute to continued adverse effects on aquatic resources, such as  
19 increased housing density near waterways.

20 As discussed in Section 3.5 of this PEIR, implementing NTMAs and  
21 LTMAAs could affect special-status fish, fish movement, nursery ground  
22 usage, riparian habitat, designated critical habitat, and essential fish habitat  
23 in several ways. Specifically, water quality could be degraded; overhead  
24 cover and instream woody material (IWM) could be lost; hydrostatic  
25 pressure, underwater noise, and vibrations could increase; and there could  
26 be increased availability of floodplain habitat (a potentially beneficial  
27 effect unless the floodplain habitat creates opportunities for fish stranding  
28 after floodwaters recede).

29 Impacts would be reduced to less-than-significant levels with  
30 implementation of Mitigation Measure BIO-A-4 (NTMA and LTMA) for  
31 increases in hydrostatic pressure, underwater noise, and vibrations and  
32 Mitigation Measure BIO-A-6 (NTMA and LTMA) for potential fish  
33 entrapment associated with increased availability of floodplain habitat.  
34 Given the minor level of impact after mitigation and the overall beneficial  
35 effect of increasing floodplain habitat, the proposed program would not  
36 result in a cumulatively considerable incremental contribution to a  
37 significant cumulative impact related to these activities.

38 Short-term construction activities associated with NTMAs and LTMAAs  
39 would involve grading and moving earth, which could result in soil erosion,  
40 stormwater discharges of suspended solids, and increased turbidity.  
41 Grading and earthmoving could also mobilize other pollutants from  
42 project-related construction sites, which could adversely affect fish habitat

(riparian habitat, critical habitat, and essential fish habitat), movement, and populations, including special-status species. In addition, contaminants such as concrete, fuels, oils, and other petroleum products used in construction activities could be introduced in the water system, either directly or through surface runoff. Contaminants may be toxic to fish and benthic macroinvertebrates or may change oxygen diffusion rates, thus causing acute and chronic toxicity to aquatic organisms and reducing their growth and survival. However, each project proponent must prepare a storm water pollution prevention plan (SWPPP) consistent with the existing statewide National Pollutant Discharge Elimination System (NPDES) discharge permits from the appropriate regional water quality control board (RWQCB). Implementing a SWPPP would cause the project to avoid increasing sedimentation and turbidity or releasing contaminants that could degrade aquatic habitats and adversely affect aquatic species. The proponent for each related project that would discharge stormwater runoff would also be required to prepare a SWPPP and comply with NPDES discharge permits from the appropriate RWQCB. Therefore, the proposed program's construction activities would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to effects of pollutants on fish habitat, movement, and populations.

Construction, remediation, or altering levees and/or the adjoining riverbanks for NTMAs and LTMAAs could require removing overhead cover and IWM (which is an important component of shaded riverine aquatic (SRA) habitat) from the river channel. Removing overhead cover and IWM could result in the loss of refugia for special-status fish from predators and high flows. It could also reduce the number of pool-forming structures and the storage capacity of the river channel for sediment and organic matter as flows are passed more quickly downstream. The project proponent would obtain a Section 1602 streambed alteration agreement from the California Department of Fish and Game (DFG), and would consult or coordinate with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service under the federal Endangered Species Act, and DFG under the California Endangered Species Act, regarding potential impacts on listed fish species (Mitigation Measure BIO-A-2a (NTMA and LTMA)). SRA habitat would be inventoried and revegetation would occur on site; if on-site compensation would not be feasible, off-site mitigation could occur, or mitigation bank credits could be acquired (Mitigation Measure BIO-A-2b (NTMA and LTMA)). In addition, DWR will coordinate with the levee maintenance agencies tasked with implementing the VMS to develop and implement a plan to record data on riparian vegetation lost or removed as a result of implementation of the VMS, and to ensure adequate compensation for losses of riparian habitat functions and values (Mitigation Measure BIO-A-2b (NTMA and LTMA)). However, there could still be a localized net loss of SRA habitat,

1 and it cannot be assured that under all circumstances, a potentially  
2 significant and unavoidable project-specific impact would not occur related  
3 to issues such as habitat connectivity.

4 Looking solely at the overall acreage of SRA habitat, implementing  
5 required mitigation measures under the proposed program would result in  
6 no net loss of acreage of SRA habitat (i.e., whatever SRA habitat could not  
7 be compensated for on a specific project site would be created elsewhere).  
8 It is possible that although some stream or river reaches may benefit from  
9 compensatory habitat, habitat values in other stream or river reaches could  
10 be substantially reduced, adversely affecting special-status fish species that  
11 must move through these river reaches. Potential adverse effects include  
12 increased predation risk, increased water temperatures, and reduced food  
13 availability. However, on a broader cumulative basis, implementing  
14 required mitigation measures would result in no net loss of habitat extent,  
15 function, and value within the overall study area because whatever aquatic  
16 habitat could not be compensated for on a specific project site would be  
17 created elsewhere. Therefore, from a cumulative context, the proposed  
18 program would not result in a cumulatively considerable incremental  
19 contribution to the cumulative loss of SRA habitat.

20 Replacing natural bank substrates with riprap can adversely affect  
21 important ecosystem functions. Living space and food for terrestrial and  
22 aquatic invertebrates are lost, eliminating an important food source for  
23 special-status fish species. Part of the proposed program could involve  
24 removing riprap and creating setback levees and floodplain habitat, which  
25 would help offset the effects of placing any new levee riprap.  
26 Implementing Mitigation Measure BIO-A-5 would require replacement of  
27 lost vegetation and IWM, but replacing all vegetation and IWM may not be  
28 possible in the immediate vicinity of a project site because some areas—  
29 especially urban areas—may lack the right-of-way needed to implement  
30 vegetation replacement. However, on a broader cumulative basis,  
31 implementing required mitigation measures would result in no net loss of  
32 habitat extent, function, and value within the overall study area because  
33 whatever aquatic habitat could not be compensated for on a specific project  
34 site would be created elsewhere. Therefore, from a cumulative context, the  
35 proposed program would not result in a cumulatively considerable  
36 incremental contribution to the cumulative loss of aquatic habitat.

37 Ongoing activities and several reasonably foreseeable future projects and  
38 programs will affect aquatic biological resources. Many of these projects  
39 and programs may adversely affect special-status fish, but others are likely  
40 to improve their condition. The net effect of new and ongoing programs,  
41 projects, and restoration efforts is difficult to predict; however, over time,  
42 the net effect expected would be a reduction or cessation of the fish

declines. Despite potential future projects that could benefit special-status fish, it is clear that the effects of past, present, and reasonably foreseeable future projects on special-status fish species have resulted in a significant cumulative impact on these species. Implementing mitigation measures related to loss of overhead cover and IWM and placement of natural bank substrates would reduce impacts on aquatic biological resources associated with the proposed program. These impacts would not necessarily be reduced to a less-than-significant level in all cases for project-specific impacts (because creating compensatory habitat may not be possible in the vicinity of project-specific impacts), or for all elements of the aquatic ecosystem important to special-status fish species. However, on a broader cumulative basis, implementing required mitigation measures would result in no net loss of habitat extent, function, and value within the overall study area because whatever aquatic habitat could not be compensated for on a specific project site would be created elsewhere. Therefore, from a cumulative context, the proposed program would not result in a cumulatively considerable incremental contribution to the cumulative loss of special-status fish, fish movement, designated critical habitat, and essential fish habitat.

#### ***Biological Resources—Terrestrial***

Cumulative impacts on terrestrial biological resources would occur primarily in the Extended SPA, where most program activities would be implemented, and to a lesser extent in the Sacramento and San Joaquin Valley watersheds. Section 3.6, “Biological Resources—Terrestrial,” provides a detailed discussion of terrestrial biological resources within the study area.

Past actions by humans have substantially changed wildlife populations and vegetation compared with historical conditions. Large areas of native riparian and wetland vegetation in the Extended SPA have been lost or degraded in the past 150 years. USFWS estimates that more than 90 percent of wetland and riparian habitat has been lost in the Central Valley compared with historic levels. Moreover, USFWS identifies most of these losses as having resulted from construction of facilities for federal and State water projects and modification of flow patterns below dams, particularly channelization, and clearing or filling for the conversion to agricultural and urban land uses. Many of these activities have also introduced nonnative plant and animal species, which in many cases have competed with and degraded habitat for native species. These changes have resulted in overall significant adverse effects on the extent, species composition, and functioning of wetlands, riparian habitats, and other sensitive communities, as well as on the distribution and abundance of wildlife species. The threatened and endangered status of numerous plant and animal species, and the dramatic reductions in the extent of wetland

1 and riparian vegetation in the study area, are evidence of these overall  
2 significant cumulative adverse effects. Present and future projects being  
3 implemented across the Central Valley, such as residential and urban  
4 development and flood-control improvement projects, would continue to  
5 result in adverse effects on terrestrial biological resources. Some of these  
6 projects, however, would implement compensatory mitigation, creating  
7 habitat and preserves to increase these habitats and their values for  
8 ecosystem functions and special-status species. Examples of such  
9 mitigation include setting back levees on the Feather River and creating  
10 habitat in the Natomas Basin, which would increase riparian floodplain and  
11 wetland habitat important to special-status fish and wildlife species (e.g.,  
12 Swainson's hawk and giant garter snake). The San Joaquin River  
13 Restoration Program would result in future structural and channel  
14 improvements to benefit special-status fish and wildlife species. In  
15 addition, reasonably foreseeable future actions include several restoration  
16 programs and plans from which vegetation and wildlife resources would  
17 benefit.

18 Many future projects that would result in significant impacts on terrestrial  
19 biological resources will be required to identify and provide mitigation in  
20 compliance with the federal and California endangered species acts,  
21 CEQA, and other State, local, and federal statutes; however, many types of  
22 habitats and species are provided no protection. Therefore, continued net  
23 loss of some types of native habitat is expected for plants and wildlife not  
24 directly tied to the needs of a threatened or endangered species.

25 However, even with compliance with regulatory requirements and  
26 implementation of mitigation, a continued decline in the extent and quality  
27 of terrestrial biological resources is expected in the program area. The  
28 overall loss of sensitive habitats, the numerous threatened and endangered  
29 species subject to those losses, the ongoing declines of other species, and  
30 continuing conversions of habitats and open space lands to various forms of  
31 development demonstrate that past, present, and reasonably foreseeable  
32 future projects combine to result in significant cumulative impacts on  
33 terrestrial biological resources.

34 As discussed in Section 3.6 of this PEIR, implementing construction-  
35 related NTMAs and LTMAAs could result in the disturbance and loss of  
36 sensitive natural communities, particularly aquatic and riparian habitats,  
37 and in the direct removal and filling of wetlands and waterways. (See  
38 Figures 3.6-1a and 3.6-1b in Section 3.6 of this PEIR for the locations of  
39 these habitats.) Removal and loss of these sensitive natural communities  
40 could contribute to additional impacts: fragmentation or substantial  
41 alteration of these habitats, increased distribution of invasive plants and  
42 wildlife, take of special-status plants and wildlife, loss of primary

1 movement corridors for many special-status wildlife species, and  
2 modification of designated critical habitat.

3 In addition, implementing construction-related NTMAs and LTMAAs could  
4 conflict with local plans and policies, including habitat conservation plans,  
5 by reducing the viability of special-status species, reducing habitat value or  
6 interfering with the management of conserved lands, or eliminating  
7 opportunities for conservation actions.

8 Mitigation measures are proposed in Section 3.6 of this PEIR to avoid,  
9 minimize, and where appropriate, compensate for potential impacts on  
10 sensitive natural communities, critical habitat, special-status plants and  
11 wildlife, wildlife movement corridors, and local plans. Construction-related  
12 impacts would be reduced to less-than-significant levels with  
13 implementation of Mitigation Measures BIO-T-1a and BIO-T1b (NTMA  
14 and LTMA) for sensitive natural communities and critical habitat; BIO-T-  
15 3a, BIO-T-3b, and BIO-T-3c (NTMA and LTMA) for special-status plants  
16 and wildlife; BIO-T-4 (NTMA and LTMA) for wildlife movement; and  
17 BIO-T-5a and BIO-T-5b (NTMA and LTMA) for local plans and policies.  
18 Because of the availability of off-site compensation for impacts on habitats  
19 and species, implementing these mitigation measures would result in no net  
20 loss to these resources, and the proposed program would not make a  
21 cumulatively considerable incremental contribution to cumulative impacts  
22 related to this issue.

23 As described above under “Biological Resources—Aquatic,” short-term  
24 construction activities associated with NTMAs and LTMAAs would involve  
25 grading and moving earth, which could result in soil erosion, stormwater  
26 discharges of suspended solids, releases of pollutants, and increased  
27 turbidity in nearby aquatic habitats. These conditions could have adverse  
28 effects on special-status wildlife species that occur in affected aquatic  
29 habitats. However, as described above, each project proponent must  
30 prepare a SWPPP consistent with the existing statewide NPDES discharge  
31 permits from the appropriate RWQCB. Implementing a SWPPP would  
32 cause the project to avoid increasing sedimentation and turbidity or  
33 releasing contaminants that could degrade aquatic habitats and adversely  
34 affect special-status species using these habitats. The proponent for each  
35 related project that would discharge stormwater runoff would also be  
36 required to prepare a SWPPP and comply with NPDES discharge permits  
37 from the appropriate RWQCB. Therefore, the proposed program’s  
38 construction activities would not result in a cumulatively considerable  
39 incremental contribution to a significant cumulative impact related to the  
40 effects of pollutants on sensitive habitats and special-status plant and  
41 wildlife species.

1 As mentioned above, the VMS includes guidelines for levee remediation  
2 design, a long-term vegetation life-cycle management plan, and  
3 coordination with DFG and USFWS. Implementing the VMS in  
4 conjunction with the CVFPP Conservation Strategy Framework could  
5 result in substantial adverse effects on sensitive habitats, special-status  
6 species, and wildlife movement corridors through removal of riparian  
7 vegetation. Implementation of Mitigation Measures BIO-T-7a and BIO-T-  
8 7b would ensure that through on-site and off-site (if needed) creation,  
9 restoration, and enhancement of riparian vegetation, the overall extent of  
10 riparian vegetation would not be reduced. On a broader cumulative basis,  
11 implementing required mitigation measures would result in no net loss of  
12 habitat extent, function, and value within the overall study area because  
13 whatever terrestrial habitat could not be compensated for on a specific  
14 project site would be created elsewhere. Therefore, from a cumulative  
15 context, the proposed program would not result in a cumulatively  
16 considerable incremental contribution to the cumulative loss of terrestrial  
17 habitat.

18 Operating new large-scale facilities and changing the operation of existing  
19 facilities under the proposed program might ultimately affect the timing  
20 and volume of downstream flows. However, any changes would remain  
21 within the range of normal flow variability under existing conditions and  
22 would not be sufficient to result in substantial alterations to existing  
23 habitats or significant adverse effects to special-status plant or wildlife  
24 species. The relative minor changes to flows associated with the proposed  
25 program would not result in a cumulatively considerable incremental  
26 contribution to the cumulative loss of habitats and special-status species.

27 As discussed above, the ability to provide compensatory off-site mitigation  
28 allows, in almost all cases, for implementation of NTMAs and LTMAAs to  
29 result in no net loss in functions and values of terrestrial biological  
30 resources in the overall program study area. On a broader cumulative basis,  
31 implementing required mitigation measures would result in no net loss of  
32 habitat extent, function, and value within the overall study area because  
33 whatever terrestrial habitat could not be compensated for on a specific  
34 project site would be created elsewhere. Therefore, from a cumulative  
35 context, the proposed program would not result in a cumulatively  
36 considerable incremental contribution to the cumulative loss of terrestrial  
37 habitat.

#### 38 ***Climate Change and Greenhouse Gases***

39 Emissions of greenhouse gases (GHGs) are inherently a cumulative impact,  
40 because the emissions of any single project would not cause global climate  
41 change. Instead, it is the GHG emissions from multiple projects throughout  
42 the world that may result in a cumulative impact with respect to global



climate change. The issue is whether a single project makes a cumulatively considerable incremental contribution to this cumulatively significant cumulative impact. Please see Section 3.7, “Climate Change and Greenhouse Gas Emissions,” for a discussion of this inherently cumulative topic area. As identified in Section 3.7, construction and operation of NTMAs and smaller scale LTMAAs (i.e., LTMAAs of similar size, intensity, and scale as NTMAAs) would not result in a cumulatively considerable incremental net contribution to GHG emissions. However, assessing net GHG emissions from larger scale projects (e.g., widening floodways, constructing new levees) is difficult because of the potential of such projects to simultaneously increase and reduce GHG emissions. For example, an enlarged or new bypass could place existing agricultural lands within a floodway. Reduced agricultural activity on these lands during the flood season could result in a net reduction in annual GHG emissions relative to existing conditions. However, the need to restore agricultural lands to production after inundation events could require additional energy and fuel not needed for flood-protected agricultural lands, resulting in additional GHG emissions. Therefore, the overall incremental contribution of large-scale LTMAAs to cumulative GHG emissions cannot be ascertained. Because of the uncertainty surrounding these impacts, no determination regarding their significance is provided. Consistent with Section 15145 of the CEQA Guidelines, these impacts are too speculative for evaluation.

### ***Cultural and Historic Resources***

The cumulative context for cultural and historic resources is defined as the Extended SPA and the Sacramento and San Joaquin Valley watersheds, which primarily incorporate three archaeological regions: the Central Valley, Northeastern, and Sierra Nevada. The eastern edge of the North Coast region is also included.

As discussed in Section 3.8, “Cultural and Historic Resources,” cultural resources may consist of prehistoric sites, historic sites, historic structures, ethnographic resources, and isolated artifacts. During the 19th and 20th centuries, localized urbanization and intensive agricultural use resulted in the destruction or disturbance of numerous prehistoric sites, and many structures now considered to be historic were erected. From the latter half of the 20th century to the present, prehistoric and historic structures have been disturbed and destroyed. Various regulations protecting cultural resources were developed and enforced during this period, substantially reducing the rate and intensity of these impacts. However, even with these regulations, cultural resources are still degraded or destroyed as cumulative development proceeds, resulting in significant adverse cumulative impacts on cultural resources.

1 Prehistoric human habitation sites are relatively common in riverbank,  
2 natural overbank deposits, and floodplain areas, and burial sites (including  
3 marked and unmarked cemeteries) are occasionally encountered in the  
4 course of ground-disturbing activities. As discussed in Section 3.8 of this  
5 PEIR, it is likely that known or unknown archaeological resources could be  
6 disturbed and cultural resources damaged or destroyed during construction  
7 of NTMAs and LTMA. Losses of an archaeological resource could occur  
8 where excavations encounter archaeological deposits that cannot be  
9 removed or recovered (e.g., underneath new facilities), or where recovery  
10 would not be sufficient to prevent the loss of the cultural material's  
11 significance. Historic resources could also be damaged or require removal  
12 from areas where new facilities or floodway expansions would occur. If  
13 these resources would be eligible for listing in the National Register of  
14 Historic Places, the impact of their modification or destruction would be  
15 significant. In addition, traditional cultural properties (which can be  
16 archaeological or built-environment resources, or features of the natural  
17 landscape) could be damaged or destroyed, or loss of use could occur if  
18 access to such properties is removed.

19 Implementing Mitigation Measures CUL-1 (NTMA and LTMA) through  
20 CUL-5 (NTMA and LTMA) would reduce effects on potentially significant  
21 cultural resources; however, adverse effects on significant historic  
22 buildings and structures and traditional cultural properties may still occur.  
23 Therefore, Impacts CUL-3 (NTMA and LTMA), and CUL-4 (NTMA and  
24 LTMA) would be potentially significant and unavoidable.

25 Reasonably foreseeable future projects related to the CVFPP could result in  
26 the same potentially significant impacts on the same types of cultural  
27 resources described above. Even if related projects were to implement  
28 mitigation measures, adverse impacts would likely still occur, and thus the  
29 impacts of the related projects would be significant and unavoidable. Loss  
30 of archaeological resources would add to a historical trend in the loss of  
31 these resources as artifacts of cultural significance and as objects of  
32 research significance. Therefore, as urban development proceeds, a  
33 significant and unavoidable cumulative impact is ongoing in the project  
34 region. Despite implementation of Mitigation Measures CUL-1 (NTMA  
35 and LTMA) through CUL-5 (NTMA and LTMA), the proposed program  
36 would result in a cumulatively considerable, incremental contribution to a  
37 cumulatively significant and unavoidable impact related to cultural and  
38 historic resources.

### 39 ***Energy***

40 A substantial amount of energy is used in the Extended SPA and the  
41 Sacramento and San Joaquin Valley watersheds, not only for water  
42 conveyance-related purposes but also for municipal, agricultural,

1 industrial, and transportation-related purposes. Hydroelectric facilities and  
2 associated pumped-storage use of electric resources in the Extended SPA  
3 and the Sacramento and San Joaquin Valley watersheds—including  
4 federally owned CVP facilities, State-owned SWP facilities, and local and  
5 privately owned facilities—were considered as the cumulative context for  
6 energy resources. The Extended SPA and the Sacramento and San Joaquin  
7 Valley watersheds have been extensively developed for large and small  
8 hydroelectric facilities with construction of dams and reservoirs. These  
9 facilities are described in Section 3.9, “Energy.”

10 Although a substantial amount of energy is used annually in California (and  
11 specifically in the program study area), this is primarily because of the  
12 state’s size and not the efficiency or inefficiency of energy use. Multiple  
13 laws, regulations, and programs within the state require or promote the  
14 efficient use of energy. Among these are various pieces of climate change  
15 legislation and the policies and programs implemented to comply with that  
16 legislation. See Table 3.7-1 in Section 3.7, “Climate Change and  
17 Greenhouse Gas Emissions,” for a summary of State laws and executive  
18 orders that address climate change, many of which have the effect of  
19 promoting or requiring the efficient use of energy in the state and the  
20 expansion of renewable-energy generation and use. California’s building  
21 codes (California Code of Regulations, Title 24) also contain stringent  
22 energy efficiency standards, and the State has adopted a specific California  
23 Green Building Standards Code that both includes energy efficiency  
24 requirements and addresses renewable energy generation (e.g., rooftop  
25 photovoltaic solar panels). Given these conditions, a cumulative adverse  
26 effect is not expected to occur in the program study area related to the  
27 substantially inefficient, wasteful, or unnecessary long-term consumption  
28 of energy or a substantial reduction in the generation of renewable energy.

29 Constructing, operating, and maintaining the facilities proposed under  
30 NTMAs and LTMAAs would require the direct and indirect use of energy  
31 resources. Direct energy use would involve using petroleum products and  
32 electricity to operate construction equipment, such as trucks and power  
33 tools. Indirect energy use would involve consuming energy to extract raw  
34 materials, manufacture items, and transport the goods necessary for  
35 construction, operations, and maintenance activities. These activities would  
36 cause irreversible and irretrievable commitments of nonrenewable energy  
37 resources, such as gasoline and diesel fuel. However, the extent to which  
38 these activities would increase energy consumption would be limited  
39 because the work would be temporary. No long-term energy use would be  
40 required and it is not anticipated that energy use would be inefficient,  
41 wasteful, or unnecessary. Therefore, these effects would not cause a  
42 cumulatively considerable incremental contribution to a significant  
43 cumulative impact related to energy use.

1 Modifications to reservoir operations included in the proposed program  
2 would not result in a long-term reduction in hydroelectric power generation  
3 (see Section 2.6, “No Near- or Long-Term Reduction in Water or  
4 Renewable Electricity Deliveries”). Therefore, the proposed program  
5 would not result in a substantial reduction in the generation of renewable  
6 energy and would not cause a cumulative considerable incremental  
7 contribution to a significant cumulative impact related to this issue.

8 ***Geology, Soils, and Seismicity (Including Minerals and***  
9 ***Paleontological Resources)***

10 The cumulative context for geology, soils, seismicity, minerals, and  
11 paleontological resources is defined as the Extended SPA and the  
12 Sacramento and San Joaquin Valley watersheds. However, geologic  
13 formations and soil types vary depending on location, and thus are site  
14 specific.

15 **Geology, Soils, and Seismicity** As discussed in Section 3.10, “Geology,  
16 Soils, and Seismicity (Including Minerals and Paleontological Resources),”  
17 strong seismic ground shaking and associated hazards such as liquefaction,  
18 surface fault rupture, and landslides would be of primary concern in the  
19 Coast Ranges, which are seismically active. Landslides are also of concern  
20 in any area of steep slopes, regardless of the seismic activity. Soil erosion,  
21 subsidence, shrink-swell potential, and soil corrosivity also may pose a  
22 hazard to engineered structures and facilities. However, implementing  
23 NTMAs and LTMAAs, such as levee repairs or improvements, would  
24 increase the resistance of the levees to damage and failure from a seismic  
25 event and from other geologic and soils related hazards (e.g., landslides,  
26 soil erosion). Improving the levee and flood conveyance systems would  
27 stabilize existing levees, and any new structures built (such as setback  
28 levees) would meet currently accepted engineering standards. As a result,  
29 facilities would be stronger and more resilient than when they were  
30 originally constructed. This would result in a beneficial impact.

31 The related projects would be subject to the same seismic, geologic, and  
32 soils hazards as the proposed program. However, all construction in  
33 California is subject to engineering requirements contained in the  
34 California Building Standards Code, which incorporates earthquake- and  
35 liquefaction-resistant design standards, in addition to design standards  
36 related to geologic and soil engineering properties. Accordingly, no  
37 additive effect would result and no cumulatively considerable impact  
38 related to seismic or soil hazards would occur. Therefore, implementation  
39 of the proposed program, when considered with the related projects, would  
40 not create additional facilities under increased risk of seismic and geologic  
41 hazards, nor would it result in a cumulatively considerable incremental

1 contribution to a significant cumulative impact related to geology, soils, or  
2 seismicity.

3 It is possible that some LTMAAs could include new wastewater-generating  
4 facilities (e.g., a restroom at a pump station) in remote locations that could  
5 not connect to a municipal sewer system. Such facilities would rely on  
6 septic tanks or alternative wastewater disposal systems for this purpose. It  
7 is possible that an area with unfavorable soils could be considered for a  
8 septic tank or alternative wastewater disposal system. However, if this were  
9 to occur, various engineering methods could be used to overcome  
10 limitations from unfavorable soils and applicable federal, State, and local  
11 regulations to ensure implementation of these measures when needed.  
12 These same regulations' corrective measures would be applied to related  
13 projects that would require installation of septic tanks or alternative  
14 wastewater disposal systems. Therefore, the proposed program would not  
15 result in a cumulatively considerable incremental contribution to a  
16 significant cumulative impact related to placement of septic tanks or  
17 alternative wastewater disposal systems in areas with unfavorable soils.

18 **Minerals** The presence of mineral resources depends on the type of  
19 geologic formation, which varies from location to location, and thus is site  
20 specific. Aggregate resources, which are typically located in or near  
21 channels or floodplains in the Extended SPA, are the mineral resources  
22 most likely to be affected by program-related activities. However, mining  
23 activity is generally precluded within or in the immediate vicinity of the  
24 footprint of existing structures, such as levees, to preserve the stability of  
25 those structures.

26 As discussed in Section 3.10 of this PEIR, many NTMAAs would occur  
27 within the footprint of existing structures, and thus would not eliminate  
28 access to mineral resources. Other NTMAAs, such as constructing setback  
29 levees, would be implemented in the immediate vicinity of existing  
30 structures, and would also not eliminate access to mineral resources.  
31 However, LTMAAs that would entail constructing new facilities, such as  
32 new flood bypasses, could occur in areas that contain valuable deposits of  
33 mineral resources. If those mineral resources, particularly aggregates, were  
34 mined as part of project-related construction activities (i.e., used in the  
35 project's construction process), no significant impact would occur.  
36 However, if mining were to not occur, the loss of access to valuable  
37 mineral resources would be a potentially significant and unavoidable  
38 impact.

39 Depending on their location, some of the related projects could also be  
40 located in areas of valuable mineral deposits. If those deposits were mined  
41 as part of the construction activities of the related projects, a significant

1 impact would not occur. However, it is not possible to determine whether  
2 the related projects would incorporate the use of any known aggregate  
3 resource deposits in their construction plans. Consequently, because of the  
4 widespread locations where LTMA construction activities under the  
5 proposed program and the related projects could occur, it is possible that  
6 two or more projects could combine to prevent access to valuable mineral  
7 resources in the same area. Thus, implementing LTMA's would result in a  
8 cumulatively considerable incremental contribution to a significant  
9 cumulative impact from loss of mineral resources.

10 **Paleontological Resources** Fossils are being discovered with increasing  
11 frequency throughout California during excavation and earthmoving  
12 activities associated with development. The value or importance of  
13 different fossil groups depends on several factors: the age and depositional  
14 environment of the rock unit that contains the fossils, their rarity, the extent  
15 to which they have already been identified and documented, and the ability  
16 to recover similar materials under more controlled conditions (such as for a  
17 research project). Discoveries of unique, scientifically important fossils are  
18 relatively rare. The likelihood of encountering them varies from site to site  
19 and is based on the specific type of geologic rock formation found  
20 underground. These geologic formations also vary, depending on location.

21 As discussed in Section 3.10 of this PEIR, construction activities associated  
22 with NTMA's and LTMA's have the potential to damage or destroy unique  
23 paleontological resources, if those activities would be located in  
24 paleontologically sensitive rock formations. However, implementing  
25 Mitigation Measure GEO-6 (NTMA and LTMA) would reduce this impact  
26 to a less-than-significant level.

27 The related projects also have the potential to damage or destroy unique  
28 paleontological resources during construction activities, if those activities  
29 would occur in paleontologically sensitive rock formations. It is not known  
30 whether all of the related projects would implement appropriate mitigation  
31 measures that would reduce or avoid impacts on paleontological resources.  
32 Therefore, the related projects themselves could result in significant  
33 impacts.

34 As discussed in Section 3.10, Mitigation Measure GEO-6 (NTMA and  
35 LTMA) specifies that, when necessary, construction personnel are to be  
36 appropriately educated before beginning construction in areas of moderate  
37 to high paleontological sensitivity. Any unique, scientifically important  
38 fossils encountered during construction must be recovered and  
39 appropriately curated by a paleontologist. When such worker education,  
40 fossil recovery, and curation occur, the subsequent opportunities for data  
41 collection and study generally benefit the scientific community. The

presence of unique paleontological resources is site specific; a low probability exists that any project would encounter unique, scientifically important fossils; and benefits would result from recovery and further study of any fossils that might be encountered. Therefore, with implementation of Mitigation Measure GEO-6 (NTMA and LTMA), the proposed program would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to paleontological resources.

### **Groundwater Resources**

The cumulative context for groundwater resources is defined as the Extended SPA, the Sacramento and San Joaquin Valley watersheds, and the SoCal/coastal CVP/SWP service areas. The Sacramento River, San Joaquin Valley, and San Francisco Bay hydrologic regions are the primary hydrologic regions in the study area. These hydrologic regions are described in Section 3.11, "Groundwater Resources."

Based on past, present, and reasonably foreseeable projects, groundwater levels in the study area are generally substantially reduced from historical levels, resulting in an overall significant cumulative impact on groundwater basins (see Figures 3.11-2 and 3.11-3 in Section 3.11 of this PEIR). Groundwater in the study area has historically been used to supplement surface water supplies. Changing environmental laws and requirements and the effects of droughts have resulted in greater reliance on groundwater supplies and conjunctive management practices. These actions have created overdraft in some portions of the study area.

NTMAs and LTMAAs could involve modifying, constructing, or removing facilities, which could result in temporary and short-term construction-related disturbance of hydrology and soil, as well as associated human-caused effects on the quality of the water encountered during construction activities. These types of disturbances could degrade the quality of waters recharging the groundwater aquifer of affected and adjacent areas. If hazardous materials were to be discharged to the land surface or surface waters during these activities, they could travel to underlying aquifers; if the volume of discharge were sufficient, such hazardous materials could degrade the quality of local groundwater sufficiently to impair its continued use. However, each project proponent must prepare a SWPPP consistent with the existing statewide NPDES discharge permits from the appropriate RWQCB. SWPPPs would be prepared for NTMAs and LTMAAs, identifying best management practices to prevent or minimize the introduction of contaminants into surface waters. The proponent for each related project that would discharge stormwater runoff would also be required to prepare a SWPPP and comply with NPDES discharge permits from the appropriate RWQCB. Therefore, the construction, operations, and maintenance activities associated with the proposed program would not

1 result in a cumulatively considerable incremental contribution to a  
2 significant cumulative impact related to localized degradation of  
3 groundwater quality from construction, operation, and maintenance  
4 activities.

5 Changing the operation of the water supply system, including the  
6 magnitude and timing of flood releases and reservoir allocations, might  
7 result in changes in the timing, duration, and frequency of river flows.  
8 Changes in river flow and subsequent surface water deliveries could  
9 require that groundwater pumping be increased to meet water supply needs.  
10 Groundwater quality could be affected by increased pumping if the  
11 pumping were to induce intrusion of saline water or upwelling of poor-  
12 quality water into aquifers used for water supply. Changes in downstream  
13 flow could reduce natural recharge, and changes in deliveries of surface  
14 water could require that groundwater pumping increase to meet water  
15 supply needs. However, implementing NTMAs or LTMAAs would not affect  
16 the capacity of reservoirs, the volume of water in the reservoirs, or  
17 carryover storage (see Impact HYD-6 (NTMA), “Reduced Long-Term  
18 Water Supplies from Reservoir Operational Criteria Changes,” in Section  
19 3.13, “Hydrology”) in a way that would increase the demand on  
20 groundwater supplies such that groundwater quality would be degraded or  
21 depleted. In addition, implementing the proposed program would not  
22 reduce long-term water deliveries to the SoCal/coastal CVP/SWP service  
23 area (see Section 2.6, “No Near- or Long-Term Reduction in Water or  
24 Renewable Electricity Deliveries”). Therefore, changes in reservoir  
25 operations included in NTMAs and LTMAAs would have negligible effects  
26 on surface water supply and groundwater supply and quality and would not  
27 result in a cumulatively considerable incremental contribution to a  
28 significant cumulative impact related to degradation of groundwater quality  
29 and depletion of groundwater.

30 Activities that could be implemented under the proposed program include  
31 improvement, remediation, repair, and reconstruction of existing levees.  
32 Depending on site conditions, slurry walls may be included in the  
33 improvement, remediation, repair, or reconstruction. Under certain  
34 conditions, there is the potential that installation of slurry cutoff walls  
35 could modify groundwater flow patterns, and affect connectivity between  
36 streams and groundwater on a regional or localized basis. In cases when  
37 water flows out of the river and into groundwater aquifers, a slurry wall  
38 could reduce natural recharge into the groundwater on the landside of the  
39 levee. In the opposite scenario, when the aquifer discharges to the river,  
40 groundwater levels on the land side of slurry cutoff walls could increase  
41 and potentially remain elevated for an extended time period. The degree to  
42 which these impacts could be realized depends on many factors, including  
43 the local geology and depth of the slurry wall in relation to saturated



1 aquifer units, the length of the slurry wall, the interconnectedness of aquifer  
2 units, the local interactions between surface and groundwater flows, soil  
3 types, and surface water conditions.

4 In the case where a slurry wall could reduce recharge to nearby shallow  
5 aquifers, any impact in the form of decreased water-table elevation would  
6 likely only impact the shallow aquifer as deep as the bottom of the wall.  
7 Furthermore, it is not anticipated that these potential impacts would  
8 propagate beyond the vicinity of the slurry wall and would thus be  
9 localized and would not substantially deplete groundwater supplies or  
10 interfere substantially with groundwater recharge such that there would be  
11 a net deficit in aquifer volume or lowering of the local groundwater table  
12 level (e.g., the production rate of preexisting nearby wells would drop to a  
13 level which would not support existing land uses or planned uses for which  
14 permits have been granted). Therefore, slurry walls included in  
15 improvement, remediation, repair, or reconstruction of levees in NTMAs or  
16 LTMAAs would not result in a cumulatively considerable incremental  
17 contribution to a significant cumulative impact related to depletion of  
18 groundwater quality or interfere substantially with groundwater recharge.

19 LTMAAs could involve enhancing groundwater recharge and banking to  
20 supplement surface water supplies in conjunction with reservoir operations.  
21 Although groundwater banking is generally beneficial, potentially  
22 significant adverse impacts could occur if groundwater banking were not  
23 properly planned before implementation or if sufficient monitoring were  
24 not conducted during operation. Specific impacts include degradation of  
25 water quality resulting from entrainment of chemicals currently in the  
26 unsaturated zone and encroachment of groundwater levels on the land  
27 surface. Implementing Mitigation Measures GRW-5a (LTMA) and GRW-  
28 5b (LTMA) would reduce this potentially significant impact to a less-than-  
29 significant level because the project proponent would develop groundwater  
30 management plans or expand existing groundwater management plans.

31 Basin management objectives, groundwater monitoring plans, and  
32 conditions under which corrective actions must be taken would be defined.  
33 The project proponent would also conduct Phase I Environmental Site  
34 Assessments. One or more of the related projects could include  
35 groundwater recharge, but it is not possible to ascertain at this time what  
36 types of mitigation measures, if any, might be undertaken as part of those  
37 projects. However, the implementation of groundwater recharge projects is  
38 regulated by the appropriate RWQCB and the California Department of  
39 Public Health with the express purpose of preventing degradation of  
40 groundwater quality. Groundwater recharge projects must comply with  
41 numeric and narrative water quality standards as set forth in the relevant  
42 basin plan, which also incorporates the State's Anti-Degradation Policy

1 (i.e., State Water Resources Control Board Resolution 68-16). Therefore, it  
2 is unlikely that any of the related projects would result in significant  
3 adverse effects on groundwater quality from recharge. For the reasons  
4 stated above, implementing LTMAAs would not result in a cumulatively  
5 considerable contribution to a significant cumulative impact related to  
6 potential groundwater recharge and banking projects.

#### 7 ***Hazards and Hazardous Materials***

8 The cumulative context for hazards and hazardous materials impacts is  
9 defined as the Extended SPA and the Sacramento and San Joaquin Valley  
10 watersheds. However, health and safety impacts associated with past or  
11 current uses of a project site usually occur on a project-by-project basis,  
12 rather than in a cumulative manner.

13 As discussed in Section 3.12, “Hazards and Hazardous Materials,”  
14 construction of NTMAAs and LTMAAs (like construction of the related  
15 projects) would involve the storage, use, disposal, and transport of  
16 hazardous materials (e.g., asphalt, fuel, lubricants, solvents) to varying  
17 degrees during demolition, construction, and operations. Facilities that  
18 would use hazardous materials after construction would be required to  
19 obtain permits and comply with appropriate standards of regulatory  
20 agencies to avoid releases of hazardous waste. Storage, use, disposal, and  
21 transport of hazardous materials are extensively regulated by various  
22 federal, State, and local agencies. Construction companies, businesses, and  
23 organizations (during the operational phase) that would handle any  
24 hazardous substances would be required by law to implement and comply  
25 with these existing regulations. Therefore, a cumulatively significant  
26 impact would not occur, and the proposed program would not result in a  
27 cumulatively considerable incremental contribution to a cumulatively  
28 significant impact associated with hazardous materials storage and  
29 transport.

30 Impacts associated with hazardous emissions and the handling of hazardous  
31 materials near schools during construction of NTMAAs and LTMAAs would  
32 be potentially significant, based on the measurable distance of 0.25 mile.  
33 Both the proposed program and the related projects could potentially use  
34 hazardous materials within this distance. Implementing Mitigation Measure  
35 HHM-2 (NTMA and LTMA) would reduce the CVFPP’s impact to a less-  
36 than-significant level by eliminating or substantially reducing the potential  
37 exposure of students to hazardous materials. This impact would occur only  
38 in site-specific locations (i.e., within 0.25 mile of any school); thus, the  
39 impact is only cumulative in nature when a related project involving  
40 hazardous emissions or handling of hazardous materials occurs within 0.25  
41 mile of the same school and at the same time as another project. The impact  
42 of the proposed program would be reduced to a less-than-significant level

(i.e., potential exposure of students to hazardous materials would be eliminated or substantially reduced), and the proposed program is highly unlikely to interact in a cumulative manner with a related project under this impact mechanism. Therefore, the proposed program would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to exposure to hazards or hazardous materials near a school.

Implementing the CVFPP could result in exposure of workers and the public to on-site hazardous materials during construction of NTMAs and LTMAAs. For example, potential sources of hazardous materials such as underground storage tanks, underground pipes containing asbestos, contaminated soils, and septic systems could be encountered during excavations. Under the proposed program implementing Mitigation Measures HHM-3a, HHM-3b, and HHM-3c (NTMA and LTMA) would minimize the potential for exposure of people and the environment to hazardous materials encountered during construction activity and include the cleanup (as required by law) of any contamination encountered, which would prevent future exposure. In addition, if hazardous materials were to be encountered on site during construction of the proposed program or related projects, the associated impacts would be localized to those project sites and would not be additive—that is, would not interact on a cumulative basis. Therefore, implementing the program would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to exposure to existing hazardous materials.

There is the potential for some NTMAs and LTMAAs to result in the creation of habitat conditions attractive to birds in the vicinity of active airports. If increased numbers of certain types of birds (e.g., waterfowl, shorebirds) were to occur near airports, this could increase bird-strike hazards for aircraft. Mitigation Measure HHM-4 (NTMA and LTMA) would reduce this impact to a less-than-significant level by requiring the project proponent to conduct a preproject avian risk analysis near airports, coordinate with the airport if a substantial increase in risk would occur, and prepare and implement a wildlife hazard management plan in coordination with the airport if necessary. Therefore, any increase in bird-strike hazards that might be generated by an NTMA or LTMA would be minimal. It is typical for airports to actively monitor planned projects in their vicinity and address potential increases in bird-strike hazards. Therefore, related projects that could occur near the same airports as NTMAs and LTMAAs would also be required to address and mitigate for potential increases in bird-strike hazards. Therefore, it is not expected that a significant cumulative impact related to increased risk of bird-strike hazards would occur, and the proposed program would not result in a cumulatively

1 considerable contribution to a significant cumulative impact related to this  
2 issue.

3 Construction of some NTMAs and LTMAAs could occur in areas designated  
4 as High or Very High Fire Hazard Severity Zones by the California  
5 Department of Forestry and Fire Protection's Fire and Resource  
6 Assessment Program. Operating construction equipment in these areas has  
7 a higher probability of sparking an uncontrolled wildland fire than  
8 operating such equipment in areas with lower fire hazard severity  
9 designation. However, the fire protection and prevention standards of the  
10 Occupational Safety & Health Administration (OSHA) of the U.S.  
11 Department of Labor (Code of Federal Regulations Title 29, Section  
12 1926.150, Subpart F) require employers to implement various measures to  
13 minimize and address wildland fire risk. The project proponents for  
14 NTMAs and LTMAAs and the proponents for related projects in High and  
15 Very High fire hazard severity zones would be required to comply with the  
16 various elements of OSHA's fire protection and prevention standard during  
17 all phases of construction; therefore, the potential for construction activities  
18 to spark an uncontrollable wildland fire is considered remote. It is not  
19 expected that a significant cumulative impact related to ignition of  
20 uncontrolled wildland fires during construction would occur, and the  
21 proposed program would not result in a cumulatively considerable  
22 contribution to a significant cumulative impact related to this issue.

23 The creation of mosquito-breeding habitat and the associated increase in  
24 mosquitoes and mosquito-borne diseases affects each regional area covered  
25 by applicable mosquito and vector control districts. When necessary, each  
26 district employs biological vector controls to reduce populations of  
27 mosquitoes throughout its service area. Implementing NTMAs and LTMAAs  
28 could increase mosquito habitat because increasing floodplain size could  
29 cause areas of standing water to increase. Implementing Mitigation  
30 Measure HHM-6 (NTMA and LTMA) would reduce the CVFPP's impact  
31 to a less-than-significant level.

32 The related projects, particularly those water-related planning efforts that  
33 would increase areas of surface water (e.g., increased floodplain), could  
34 also cause mosquito habitat to increase, and there is no way to determine  
35 whether related projects would include mitigation measures to reduce those  
36 impacts. However, mosquito and vector control districts typically take an  
37 active role in reducing risk of mosquito-borne diseases, either by working  
38 with project proponents to minimize risk through modifications to project  
39 design and/or by minimizing risk after project implementation (e.g.,  
40 planting mosquito fish (*Gambusia* sp.) or utilizing other vector controls).  
41 Therefore, a significant cumulative impact related to hazards from  
42 increased risk of mosquito-borne diseases is unlikely, and the proposed

program's contribution after mitigation would not result in a cumulatively considerable contribution to a significant cumulative impact related to this issue.

#### **Hydrology**

The cumulative context for hydrology is defined as the Extended SPA and the Sacramento and San Joaquin Valley watersheds. The cumulative context for flood management resources is limited to the Extended SPA.

The purpose of the proposed program is to improve flood management, thereby reducing the frequency of the damage caused by flooding. Implementing some individual NTMAs or LTMAAs might somewhat alter the existing course of a stream or river (e.g., widen the floodway with a setback levee). However, implementing the overall proposed program would not increase flooding on or off site, other than as part of intended floodway expansion, such as where land currently receiving flood protection is placed within a new flood bypass. Individual NTMAs or LTMAAs would not be implemented or approved if water surface elevation, and thus the potential for flooding, would increase above the maximum allowed rise set by the U.S. Army Corps of Engineers or the Central Valley Flood Protection Board. The project proponent for any NTMA or LTMA would need to obtain permits and approvals, such as Section 408 and 208.10 and Central Valley Flood Protection Board encroachment permits, to be able to implement the project. These permits require that there be no increase in flooding. Hence, any flooding impacts associated with a specific activity would need to be mitigated and the project would need to be modified before implementation.

In addition, implementing NTMAs or LTMAAs would not increase the rate or amount of surface runoff in a manner that would substantially increase the risk of flooding, locally impede flow, or transfer flood risk to downstream areas. Under LTMAAs, providing additional flood storage via widened floodways or bypasses or new bypasses would temporarily hold water that otherwise would have posed a more immediate flood risk to downstream areas. Implementing LTMAAs would result in beneficial effects because the overall flood system's conveyance would be improved, thereby lowering flood risk, including the risk associated with redirected flood flows.

The related water projects may also contain components that are intended to reduce the overall risk of flooding. In that sense, the proposed program and the related water projects would result in beneficial impacts on flood management resources. Therefore, the program would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to flood risk.

1 The proposed program and the related water projects would not entail  
2 residential construction, and thus homes would not be placed within a  
3 designated 100-year flood hazard area. Implementing the NTMAs and  
4 LTMAAs would provide a higher level of flood protection for some areas  
5 currently protected by facilities of the State Plan of Flood Control.  
6 Providing a higher level of flood protection could potentially cause the  
7 boundaries of some flood hazard areas to change, which would cause  
8 existing homes in those areas to no longer be within a flood hazard area.  
9 The land use-related policy changes in NTMAs and LTMAAs would  
10 discourage construction of new homes in a flood hazard area. Further  
11 opportunities to construct new homes within a 100-year flood hazard area  
12 would be removed where flood, conservation, or other easements are  
13 purchased. (See Section 3.14, “Land Use and Planning,” for further  
14 discussion of the potential for policies on the applicable level of flood  
15 protection to alter residential land use patterns.) Therefore, this effect  
16 would be beneficial and the proposed program would not result in a  
17 cumulatively considerable incremental contribution to a cumulatively  
18 significant impact related to placing homes in a designated 100-year flood  
19 hazard area.

20 Implementing some NTMAs or LTMAAs could change the existing  
21 hydraulics of the affected river systems, increasing erosion or siltation. As  
22 a result of these hydraulic changes, the rivers and streams may be subject to  
23 changes in the duration, depth, or velocity of flows, which could increase  
24 waterside erosion or siltation. Changes in flows from NTMAAs would not be  
25 sufficient to result in a significant adverse effect. The combination of  
26 reoperating reservoirs, widening floodways, and operating floodplain  
27 storage areas under LTMAAs could increase erosion to a greater degree and  
28 could result in a significant impact. Implementing Mitigation Measure  
29 HYD-1 (LTMA) would reduce this impact to a less-than-significant level  
30 by identifying and implementing measures to minimize downstream  
31 erosion and siltation. The related projects as they pertain to flood control  
32 are designed to minimize erosion as part of the projects themselves; the  
33 remaining related projects are required to develop and implement best  
34 management practices and SWPPPs to reduce erosion. Therefore, the  
35 proposed program would not result in a cumulatively considerable  
36 incremental contribution to a cumulatively significant impact related to  
37 increased erosion.

38 Neither the proposed program nor the related water projects would place  
39 facilities in areas that would be subject to inundation by seiche or tsunami.  
40 Because the proposed program would not result in a seiche or tsunami  
41 inundation hazard, the program also would not result in a cumulatively  
42 considerable incremental contribution to a cumulatively significant impact  
43 related to this topic.

As described in Section 2.6, “No Near- or Long-Term Reduction in Water or Renewable Electricity Deliveries,” the proposed program would not result in long-term reductions to water deliveries to the SoCal/coastal CVP/SWP service areas. For reasons similar to those described in Section 2.6, the proposed program would not result in reductions in available water in other portions of the study area. Therefore, the proposed program would also not result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to water supply.

### ***Land Use and Planning***

The cumulative context for land use and planning consists of the cities and counties within the Extended SPA and the Sacramento and San Joaquin Valley watersheds. Section 3.14, “Land Use and Planning,” describes the historic and existing land uses in the study area. The cities and counties in the Extended SPA are shown in Figures 3.14-1a and 3.14-1b, and the cities and counties in the Sacramento and San Joaquin Valley watersheds are shown in Figure 3.14-2.

Implementing conveyance-related, storage-related, and other NTMAs and LTMAAs would not result in the physical division of an established community; the proposed program would not contribute to a cumulative impact on this basis.

Implementing conveyance-related, storage-related, and other NTMAs and LTMAAs would alter agricultural and recreational land uses, resulting in changes to those land use patterns that would cause potentially significant and significant adverse physical environmental effects. The cumulative land use impacts associated with changes in patterns of agricultural and recreational land uses would be the same as the cumulative impacts discussed above in “Agriculture and Forestry Resources” and below in “Recreation,” respectively. Implementation of Mitigation Measures LU-5a, LU-5c, and LU-5d (NTMA and LTMA) would reduce significant impacts associated with the removal of residences and changes in recreation land uses to a less-than-significant level. Implementation of Mitigation Measures LU-5b and LU-8 (NTMA and LTMA) would lessen the significant impact associated with changes in agricultural land use patterns, but not to a less-than-significant level. Even with implementation of Mitigation Measures LU-5a through LU-5c and LU-8 (NTMA and LTMA), the proposed program would contribute to changes in patterns of agricultural and recreational land uses that would result in adverse physical effects on the environment, which are already occurring even without the project. Therefore, implementing the proposed program would result in cumulatively considerable incremental contributions to cumulatively significant impacts related to agricultural and recreational land uses.

1 California's planning laws delegate the authority over land use and land use  
2 planning to local jurisdictions. The nature and extent of changes made to  
3 local land use plans or development permitting processes in response to  
4 statutorily established 2007 flood legislation requirements for the  
5 applicable level of flood protection would be determined by local planners  
6 and decision makers in jurisdictions throughout the Central Valley.  
7 Statutorily required amendments to land use plans and zoning codes are  
8 policy-related and regulatory effects on land use regulation, rather than  
9 physical environmental effects in and of themselves; therefore, adoption of  
10 such amendments would not be considered direct impacts of the CVFPP.  
11 As a result, implementing the proposed program would not directly result  
12 in cumulatively considerable incremental contributions to a cumulatively  
13 significant land use impact.

14 Implementing statutorily established 2007 flood legislation requirements  
15 for the specified levels of flood protection could indirectly change land  
16 uses and/or patterns of land use, should cities or counties be unable to  
17 provide adequate flood protection and instead choose to redirect land uses  
18 and new development to less flood-prone areas. The effects of such  
19 changes could be environmentally adverse or beneficial, depending on the  
20 nature of future land use planning undertaken by local agencies and  
21 jurisdictions with land use authority. It is currently unknown which cities  
22 and counties would revise their land use plans to redirect land use and  
23 development away from flood-prone areas, and to what extent these  
24 changed plans would result in adverse or beneficial environmental effects;  
25 therefore, no further analysis is possible. Thus, because a reasonable  
26 conclusion cannot currently be reached about the potential for adverse  
27 environmental effects to result from redirecting land use and development  
28 to comply with the requirements for the urban level of flood protection, this  
29 impact is too speculative to make a significance determination.

### 30 **Noise**

31 The cumulative context for noise is the Extended SPA and the Sacramento  
32 and San Joaquin Valley watersheds, where noise receptors and generators  
33 are expected to be affected by the proposed program. Section 3.15,  
34 "Noise," describes the fundamentals of noise and vibration and the existing  
35 noise environment in the study area. It also identifies the types of sensitive  
36 receptors that may potentially be affected by noise with implementation of  
37 the proposed program. Noise and vibration are localized occurrences that  
38 attenuate rapidly with distance. Therefore, only future development  
39 projects and flood control projects in the immediate vicinity of the study  
40 area that occur at the same time as noise- and vibration-generating program  
41 activities would have the potential to add to noise and vibration generated  
42 by program activities, thus resulting in cumulative noise and vibration  
43 impacts.



1 Construction activities could potentially expose sensitive receptors to noise  
2 levels in excess of the applicable noise standards and/or result in a  
3 substantial increase in ambient noise levels. However, traffic noise levels  
4 under the proposed program are not expected to increase to a level that  
5 would result in exceedence of applicable thresholds.

6 Implementing noise-reducing construction practices (Mitigation Measure  
7 NOI-1 (NTMA and LTMA)) would reduce potentially significant noise  
8 impacts associated with construction activities to a less-than-significant  
9 level. The related projects could also result in construction noise that has  
10 the potential to exceed local noise ordinances. However, to result in a  
11 cumulative noise impact, construction of a related project would need to  
12 occur at the same time as and close to construction of an NTMA or LTMA.  
13 In addition, many local noise ordinances provide special provisions for  
14 construction-related noise, allowing construction activities to be considered  
15 in compliance with the ordinance even if the noise generated exceeds the  
16 standards applied to other activities. The separate treatment of construction  
17 noise is often an acknowledgment that construction noise is temporary, that  
18 reducing noise levels below a particular threshold is frequently infeasible  
19 because of the high noise levels inherent in operation of construction  
20 equipment, and that construction often must occur near sensitive receptors.  
21 Some jurisdictions also make special provisions allowing nighttime  
22 construction to occur without considering such construction a violation of  
23 applicable noise regulations. Where local noise ordinances applicable to a  
24 project allow for such provisions, compliance with the ordinance can be  
25 considered sufficient mitigation and an indication of a less-than-significant  
26 impact. Therefore, even if an NTMA or LTMA were constructed at the  
27 same time as and close to construction of a related project, construction  
28 noise would not exceed local standards. Given these conditions, the  
29 proposed program would not result in a cumulatively considerable  
30 incremental contribution to a significant cumulative impact related to  
31 construction noise.

32 Construction activities in the study area may result in varying degrees of  
33 temporary ground vibration, depending on the specific construction  
34 equipment used and the operations involved. Specific NTMAs and  
35 LTMA, and thus the vibration-generating equipment that would be used,  
36 are unknown at this time. Sensitive receptors could be exposed to  
37 groundborne vibration levels that could exceed the acceptable vibration  
38 standards of the California Department of Transportation or Federal Transit  
39 Administration. Implementing Mitigation Measure NOI-2 (NTMA and  
40 LTMA) would reduce this potentially significant impact to a less-than-  
41 significant level because project proponents would implement vibration-  
42 reducing measures before and during construction activities that occur  
43 within 300 feet of a receptor sensitive to vibration disturbance. For a

1 cumulative vibration impact to occur, construction activities generating  
2 groundborne vibration from a related project would need to occur at the  
3 same time as and very close to construction activities for an NTMA or  
4 LTMA generating groundborne vibration. Groundborne vibration  
5 attenuates very quickly, dissipating over short distances (i.e., hundreds of  
6 feet for unmitigated vibration sources), resulting in the requirement that  
7 vibration sources be very close together to interact in a cumulative manner.  
8 For vibration impacts mitigated to a less-than-significant level, extreme  
9 proximity between two sources would be required for a cumulative effect  
10 to occur. This scenario is highly unlikely, with vibration levels great  
11 enough to result in a significant cumulative impact being even more  
12 unlikely. Therefore, the proposed program would not result in a  
13 cumulatively considerable incremental contribution to a cumulative impact  
14 related to groundborne vibration.

15 Implementing NTMAs and LTMA's could generate long-term noise during  
16 operation of stationary noise sources (e.g., water pumps). Depending on the  
17 locations of management actions and the equipment needed for long-term  
18 operation, a new source of noise could be introduced near sensitive  
19 receptors. Specific NTMAs and LTMA's have not yet been defined;  
20 however, stationary-source noise levels could increase under the proposed  
21 program. Thus, introducing a long-term stationary-source noise under the  
22 program could expose sensitive receptors to noise levels that would exceed  
23 applicable noise standards. Mitigation Measure NOI-3 (NTMA and  
24 LTMA) would require that design techniques include measures to reduce  
25 operational noise. As a result, this potentially significant impact would be  
26 reduced to a less-than-significant level. Stationary-source noise associated  
27 with the related projects could potentially create noise levels that would  
28 exceed the applicable noise standards. These related projects consist  
29 primarily of flood control, habitat restoration, and air quality/climate action  
30 plans and urban development. The noise from any stationary noise sources  
31 associated with the related projects could be controlled at the source (by  
32 means of noise walls, enclosures, site planning, and so on) to meet local  
33 noise standards; however, there is no guarantee that all the related projects  
34 would include such noise controls as part of their proposals. Hence,  
35 significant cumulative noise impacts associated with stationary noise  
36 sources could occur under the related projects. However, noise levels are  
37 not directly additive and attenuate rapidly with distance. Stationary-source  
38 noise would be localized, particularly mitigated low-level noise from  
39 NTMAs and LTMA's and would be unlikely to combine with noise from  
40 other projects in the region to produce cumulative noise impacts.  
41 Therefore, the proposed program would not result in a cumulatively  
42 considerable incremental contribution to a cumulative noise impact related  
43 to stationary noise sources.

### ***Population, Employment, and Housing***

The cumulative context for population, employment, and housing consists of the cities and counties within the Extended SPA and the Sacramento and San Joaquin Valley watersheds where the proposed program could result in construction or increases in operational and maintenance-related activities that could induce population growth. The existing and projected population, employment, and housing in these cities and counties are described in Section 3.16, “Population, Employment, and Housing.”

Multiple NTMAs and LTMAAs could be implemented concurrently, but projects would be implemented throughout the Central Valley, and economic activity (and thereby growth) would likely not be concentrated in any one area. The sizes of construction crews would vary, but crews are not expected to be large enough to exhaust local labor markets and attract substantial numbers of new residents. This is particularly the case because the current economic downturn, which has resulted in higher-than-normal levels of unemployed workers in the construction sector, is projected to continue for several years into the future. For construction activities, increases in socioeconomic activity would be localized and short term, lasting as long as a particular project’s construction period. In many instances, construction jobs would be filled by local employees, with projects needing to be particularly large or particularly remote to require employees from outside a reasonable daily commute distance. Related projects would be expected to result in similar impacts with similar results as far as construction jobs being filled by the existing available labor pool. Therefore, implementing the proposed program would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to substantial population growth from construction activities.

Operation and maintenance of NTMAs and LTMAAs could also generate new jobs, economic activity, and therefore, population growth. However, NTMAs and LTMAAs would not require extensive staff for operations and maintenance. A handful of full-time employees can operate and maintain many miles of levees and other flood control facilities. Any increases in operations and maintenance jobs could be filled by local employee pools, resulting in little to no change in population growth in the area. Related flood control projects that would involve operating and maintaining new facilities would be expected to result in similar impacts. Many of these projects would entail some number of employment opportunities, which would likely be filled by local employee pools; therefore, implementing the proposed program would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to substantial population growth from operational activities.

1 Reasonably foreseeable population growth in the Extended SPA and the  
2 Sacramento and San Joaquin Valley watersheds is planned for in city and  
3 county general plans. Population projections are generally based on  
4 assumptions about expected development trends within the city limits and  
5 proposed city spheres of influences or planning areas and within county  
6 boundaries. The related projects could result in significant impacts related  
7 to substantial population growth from future urban development within the  
8 study area if any projects, or combinations of projects, were to result in  
9 growth significantly greater than anticipated in city and county general  
10 plans. Section 3.16 of this PEIR provides current and future population  
11 trends for counties within the Extended SPA and the Sacramento and San  
12 Joaquin Valley watersheds (see Table 3.16-1). For an impact related to  
13 population growth to be considered significant, the population growth  
14 would have to exceed planned growth for the region; thus, based on the  
15 projected growth rates for 2010–2030, annual population growth in any one  
16 county and/or planning area exceeding 2.0 to 3.0 percent would likely  
17 result in a significant impact. However, given the conditions described  
18 above, it is not expected that construction-related and operational activities  
19 for NTMAs and LTMAAs would generate sufficient population growth to  
20 exceed the growth rates projected in the region. Given the temporary nature  
21 of construction jobs and the minimal job generation associated with  
22 operation and maintenance of program facilities, even the combined  
23 construction and operation of all the projected NTMAs and LTMAAs, when  
24 considered in combination with the related projects, would not result in a  
25 cumulatively considerable incremental contribution to a significant  
26 cumulative impact related to substantial population growth.

27 Substantial numbers of housing and/or people would not be displaced with  
28 implementation of the NTMAs or LTMAAs because new flood control  
29 facilities would be constructed in rural areas where there are few residential  
30 land uses and existing facilities would typically be repaired and  
31 reconstructed in place. In addition, land uses would not change so  
32 dramatically that homes would have to be destroyed to make way for new  
33 or improved flood management structures. Mandatory compliance with the  
34 National Flood Insurance Program or with policy changes requiring  
35 homeowners to pay for additional flood insurance may create a financial  
36 hardship for some families. Those families may find it more financially  
37 prudent to move out of the flood zone and avoid the requirement for flood  
38 insurance altogether. However, this scenario is projected to occur only in a  
39 few very limited cases. The related projects would be expected to result in  
40 similar impacts with similar results. Projects related to flood control,  
41 habitat restoration, and air quality/climate action plans typically do not  
42 result in displacement of substantial numbers of people. Therefore, the  
43 related projects are not expected to result in significant impacts involving  
44 displacement of substantial numbers of people. The proposed program

would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to this issue.

With regard to the potential to induce substantial unemployment, the various proposed NTMAs and LTMAAs could both increase or decrease employment opportunities through mechanisms such as creating demand for construction jobs, increasing or decreasing operations and maintenance demands, preserving or reducing the number of agricultural jobs, and increasing or decreasing recreational opportunities. For example, the proposed program is expected to involve purchasing easements and developing habitat, which could take agricultural land out of production, thereby reducing local agriculture-related employment to some degree. Conversely, purchasing easements could also result in the preservation of agricultural land and restoring habitat could increase recreational opportunities, thereby increasing the availability of jobs serving the recreation sector. Overall, if implementing NTMAs and LTMAAs were to result in a net decrease in jobs, the decrease would not be considered substantial, especially if considered on a countywide or regional level. The related projects would not be expected to result in substantial unemployment, for reasons similar to those described for the proposed program. Therefore, a significant cumulative impact related to unemployment is not expected to occur with implementation of the related projects. Implementing the proposed program would not result in a cumulatively considerable incremental contribution to a significant cumulative impact.

### **Public Services**

In terms of cumulative impacts, providers of public services are responsible for ensuring that adequate services are provided within their jurisdictional boundaries. These boundaries range from local (e.g., city and county police and fire departments) to regional and statewide (e.g., the California Department of Forestry and Fire Protection's service districts). The geographic context for this analysis consists of those police and fire service providers that operate within the Extended SPA and the Sacramento and San Joaquin Valley watersheds. Section 3.17, "Public Services," describes police and fire services within the study area.

The potential for construction-related and operational activities associated with NTMAs and LTMAAs to result in a need for increased fire or police protection services, such as additional officers and equipment, is remote because adequate service is typically provided in the region by local county and city service departments and NTMAs and LTMAAs would generate little to no demand for additional services. With regard to demand for fire protection services, NTMAs and LTMAAs would be conducted in compliance with OSHA standards, which require development and

1 implementation of a project-specific fire protection program. Therefore,  
2 implementing the proposed program would result in less-than-significant  
3 impacts on the need for increased fire or police services. Related flood  
4 control and restoration projects would result in similar less-than-significant  
5 impacts. Therefore, implementing the proposed program would not result  
6 in a cumulatively considerable incremental contribution to a significant  
7 cumulative impact related to the provision of fire and police protection  
8 services.

### 9 ***Recreation***

10 The cumulative context for recreation is defined as the Extended SPA and  
11 the Sacramento and San Joaquin Valley watersheds. Recreational facilities  
12 in the study area are described in Section 3.18, "Recreation." Various  
13 recreational opportunities and facilities are provided in the Sacramento and  
14 San Joaquin Valley and foothills by large multipurpose reservoirs on the  
15 Sacramento and San Joaquin rivers and their major and minor tributaries.  
16 Recreation is not among the original purposes of most of the reservoirs;  
17 however, all these reservoirs provide water-based, water-related, or water-  
18 enhanced recreation opportunities (e.g., camping, picnicking, hiking, and  
19 boating) and recreation facilities accessible to the public. The Sacramento  
20 and San Joaquin rivers and their tributaries provide river-based recreational  
21 opportunities, including fishing, boating, and whitewater rafting. Numerous  
22 water-based recreation opportunities are available in the Delta, including  
23 boating and fishing. The watersheds of the Sacramento and San Joaquin  
24 valleys include numerous federal, State, regional, and local lands and  
25 recreation facilities that provide land-based recreation opportunities, such  
26 as hiking, camping, wildlife viewing, bird-watching, and hunting. These  
27 areas often contain a range of developed recreation facilities, such as  
28 campgrounds, picnic areas, visitor centers, boat ramps and marinas, and  
29 trails.

30 Facilities associated with NTMAs and LTMAAs may displace existing  
31 recreational facilities or reduce existing access to recreation. Existing  
32 recreational facilities could be removed, or potentially integrated into flood  
33 control facility improvements or repairs or new flood control facilities.  
34 NTMAs and LTMAAs could also limit access to existing facilities by  
35 displacing existing access roads, trails, or parking areas. Existing  
36 alternative recreation facilities and opportunities in an affected area may be  
37 unavailable or inadequate for the level of demand generated by the loss of  
38 facilities caused by the proposed program. Therefore, these management  
39 activities may result in a substantial reduction in recreation opportunities  
40 that could require construction of replacement facilities elsewhere.  
41 Implementing Mitigation Measures REC-1 (NTMA and LTMA) and REC-  
42 7 (LTMA) would reduce potentially significant impacts to a less-than-  
43 significant level by replacing displaced recreation facilities and access. The

related projects could result in similar recreation impacts, and because there is no guarantee that the related projects would include mitigation measures to replace recreation facilities and access, the related projects could result in significant impacts. However, the proposed program would ensure the replacement of any displaced recreational facilities or access. Thus, implementing the proposed program would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to the displacement of recreational facilities.

Temporary construction-related activities may conflict with the ability of recreationists to use or access recreation facilities or engage in recreation activities during the construction period. However, these effects would be infrequent, temporary, and short term, occurring only during the period when NTMA or LTMA construction activities take place near a recreation facility. In almost all instances, other similar recreation opportunities would be available in a region during construction. Given these conditions, this impact would be less than significant. However, Mitigation Measure REC-2 (NTMA and LTMA) is provided to further reduce this impact by directing that construction activities and staging be avoided near recreational facilities and that such activities be timed to avoid the high-use recreation season. The related projects could result in similar construction-related recreation impacts. Effects on recreation resources typically are infrequent, short term, and temporary; however, there is no guarantee that some related projects may not have substantially longer construction periods, thus resulting in a more severe impact, and that they would include mitigation measures to avoid conflicts with recreational use during construction. Therefore, some related projects could result in significant impacts. However, the proposed program would ensure that construction activities do not substantially affect recreation access. Thus, implementing the proposed program would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to this issue.

Changing the operations of existing reservoirs could also alter the amount and timing of the annual reservoir drawdown, which could reduce access to recreational facilities and opportunities for recreation. Increasing reservoir drawdown may affect the functionality and capacity of recreational facilities such as boat ramps or marinas, and may reduce the length of time when these facilities are available to the public each year. Conversely, reduced drawdown may enhance recreational access and use by maximizing the amount of reservoir shoreline and surface area available for recreation and maximizing boat access to shallow bays and coves. However, these changes in reservoir operations are expected to be minimal, and therefore would result in less-than-significant impacts for both NTMA and LTMA. In addition, it would be rare for this very location-based effect

1 to interact with a related project. Implementing reservoir reoperation  
2 elements of the proposed program would not result in a cumulatively  
3 considerable incremental contribution to a significant cumulative impact  
4 related to recreational facilities at reservoirs.

5 Conducting construction activities from barges in waterways would cause  
6 temporary boat navigation hazards and restrict passage by recreational boat  
7 traffic. Implementing Mitigation Measure REC-4 (NTMA and LTMA)  
8 would reduce potentially significant impacts to a less-than-significant level  
9 because safe boat passage would be maintained and appropriate safety  
10 measures would be provided to minimize navigation hazards posed by  
11 construction equipment and activity in waterways. The related flood  
12 control projects may also entail conducting construction activities from  
13 barges in waterways. Because there is no guarantee that the related projects  
14 would include mitigation measures to ensure that recreational boat traffic is  
15 not impeded, the related projects could result in significant impacts.  
16 However, given the large amount of water-based recreation within the  
17 Extended SPA and the localized, short-term nature of barge transport, the  
18 limited amount of barge-related construction from the proposed program  
19 in combination with the related projects is not expected to result in  
20 substantial impacts on recreation. Therefore, implementing the proposed  
21 program would not result in a cumulatively considerable incremental  
22 contribution to a significant cumulative impact related to boating hazards.

23 In certain cases, implementing aspects of the VMS may cause woody  
24 vegetation, including shade trees, to be eliminated from levees within the  
25 identified vegetation management zone. Where woody vegetation would be  
26 removed from levees and adjacent levee toes, the area's attractiveness for  
27 terrestrial recreational activities such as boating, bank fishing, and wildlife  
28 viewing could decline. Although changes in vegetation conditions resulting  
29 from the proposed program could adversely affect the quality of some  
30 recreation activities in some areas, these effects would not be substantial  
31 because lower levee slopes and waterside vegetation would be unaffected  
32 in a vast majority of cases. Where the vegetation of most importance to  
33 recreation quality would be affected, on-site mitigation (for biological  
34 resources) to restore waterside woody vegetation would minimize the  
35 potential effects on recreation. In addition, adverse effects of removing  
36 vegetation in some areas would be offset in many cases by planting of  
37 riparian vegetation elsewhere. For related projects to add to this impact in a  
38 cumulative manner, they would need to result in removal of woody  
39 vegetation from levees above and beyond that assumed in the VMS.  
40 Because of the substantial permitting and mitigation requirements  
41 associated with removal of woody riparian vegetation, there is a substantial  
42 incentive for project proponents to minimize effects on woody riparian  
43 vegetation. Where woody riparian vegetation is removed, it must be



replaced, often at mitigation ratios greater than 1 to 1. Therefore, although past projects may have resulted in substantial cumulative regional reductions in woody riparian vegetation in the Extended SPA, this is highly unlikely to occur for future projects. Therefore, an adverse cumulative impact on recreation facilities and opportunities from removal of woody riparian vegetation would not occur. Implementing the proposed program would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to this issue.

### ***Transportation and Traffic***

The cumulative context for transportation and traffic is the Extended SPA because a majority of impacts are expected from construction-related activities adjacent to a project area. As discussed in Section 3.19, “Transportation and Traffic,” Interstates 5 and 80, State Route 99, and U.S. Highway 50 are major transportation corridors that provide access throughout the Extended SPA. In addition, other local State routes individually serve the Sacramento and San Joaquin Valley and foothills and the Delta. Levee roads are located throughout the Central Valley, with a large concentration of them in the Delta. Particularly in the Delta, levees surround and protect a large number of islands or tracts, with levee roads and bridges connecting these islands.

Construction activities associated with NTMAs and LTMAAs have the potential to temporarily increase traffic in the areas adjacent to construction zones and over any haul routes. Construction and ground-disturbing activities associated with NTMAs and LTMAAs also may require construction workers to drive to site locations and trucks to deliver materials and fill (if needed) and remove debris. As a result, construction of NTMAs and LTMAAs may result in substantial (although temporary) increases in traffic on nearby roadways. Mitigation Measure TRN-1 (NTMA and LTMA) would require that traffic-reducing construction measures be implemented to minimize interference to local and regional traffic flows from construction activities. This mitigation measure would be sufficient to reduce this impact to a less-than-significant level for NTMAAs; however, because of the larger construction effort associated with some LTMAAs, a less-than-significant conclusion after mitigation cannot be assured for all LTMAAs.

Temporary increases in traffic and reductions in roadway capacity would also result from construction activities for various related projects in the study area. Those impacts would be evaluated in the environmental review documents for the projects with which the impacts would be associated, and they would be mitigated to the extent feasible. However, traffic impacts are very site specific, and certain roadway segments or intersections could be near their operating capacity. Adding traffic from

1 multiple projects, even if each contribution were individually less than  
2 significant, could result in a substantial degradation of roadway or  
3 intersection operations. If an NTMA or LTMA were constructed close to a  
4 related project at the same time that construction of the related project was  
5 under way, a substantial cumulative increase in traffic levels could occur.  
6 Given these conditions and the potential for large LTMAs to result in a  
7 significant and unavoidable impact related to temporary construction  
8 traffic, implementing the proposed program would result in a cumulatively  
9 considerable incremental contribution to a significant cumulative impact  
10 related to temporary increases in traffic from construction activities.

11 Existing transportation infrastructure may be removed or temporarily  
12 disrupted as a result of some NTMAs and LTMAs. Some roads, rail lines,  
13 or bicycle paths may need to be completely or temporarily closed to  
14 accommodate construction activities. Infrastructure would be most likely to  
15 be removed in rural areas where new flood control structures would be  
16 constructed or easements would be purchased. It is unlikely that any major  
17 transportation corridors would be located in the areas being proposed for  
18 these actions, but some smaller local roads may be present. Implementing  
19 Mitigation Measure TRN-2 (NTMA and LTMA) would require the project  
20 proponent to provide convenient detours to closed or disrupted routes by  
21 implementing a traffic plan. This mitigation measure would reduce impacts  
22 associated with small and medium-sized program activities to a less-than-  
23 significant level. However, for larger projects, even with mitigation, these  
24 impacts could be significant and unavoidable. Consequently, implementing  
25 the proposed program could result in a cumulatively considerable  
26 incremental contribution to a significant cumulative impact related to the  
27 removal or temporary disruption of transportation infrastructure.

28 Construction activities may require temporary lane reductions or changes to  
29 roadway alignments to accommodate contractor work areas. These  
30 temporary alterations to roadway operations could generate safety hazards  
31 for motorists, pedestrians, and bicyclists. However, standard traffic control  
32 measures such as signage and flagpersons would be included in all  
33 construction activities. With implementation of these standard contractor  
34 requirements and enforcement of speed limits in construction zones,  
35 impacts related to transportation safety hazards during construction of  
36 NTMAs and LTMAs would be less than significant. Many of these  
37 standard traffic management measures are required by local jurisdictions  
38 for issuance of building permits and/or temporary access easements or road  
39 rights-of-way. Therefore, it is anticipated that similar measures to reduce  
40 transportation hazards during construction would be implemented for all  
41 related projects. With construction-related transportation safety hazards  
42 addressed both on a project-by-project basis and on a broader level by local  
43 jurisdictions, a significant cumulative impact is not expected to occur. The

1 proposed program would not result in a cumulatively considerable  
2 incremental contribution to a significant cumulative impact related to  
3 increased transportation hazards due to construction.

4 NTMAs and LTMAAs may require the temporary or partial closure of roads.  
5 Many of the management actions are tied to levees, where both emergency  
6 response and evacuation routes are limited. Standard procedures require  
7 preservation of both emergency response and evacuation routes at all times.  
8 However, because construction activities could temporarily disrupt an  
9 emergency response or evacuation route, a potentially significant impact  
10 would occur. This impact would be reduced to a less-than-significant level  
11 for both NTMAs and LTMAAs with implementation of Mitigation Measure  
12 TRN-4 (NTMA and LTMA), which requires coordination and consultation  
13 with emergency response agencies to maintain acceptable levels of passage  
14 for emergency response vehicles and for evacuations. Such coordination is  
15 a typical practice for construction projects and is often required by local  
16 jurisdictions. Therefore, similar less-than-significant effects on emergency  
17 response and evacuation routes would be expected for all related projects.  
18 Therefore, a significant cumulative impact related to this issue is not  
19 expected to occur. The proposed program would not result in a  
20 cumulatively considerable incremental contribution to a significant  
21 cumulative impact.

22 Expanding the footprint of existing flood protection facilities, building new  
23 facilities, and purchasing easements could interfere with local agencies'  
24 adopted plans for bicycle and pedestrian facilities. However, improvements  
25 to bicycle and pedestrian facilities can often be integrated into flood  
26 protection projects (e.g., by constructing or reconstructing a segment of  
27 bike path on a seepage berm), thus allowing current use of facilities to  
28 continue or construction of facilities included in agency plans. Project  
29 proponents would be expected to consult with appropriate local agencies to  
30 minimize the impacts of NTMAAs on future agency plans for bicycle and  
31 pedestrian infrastructure. Given the ability to incorporate bicycle and  
32 pedestrian facilities into the design of many NTMAAs and LTMAAs and the  
33 flexibility available for routing and locating many bicycle and pedestrian  
34 facilities, the potential for irreconcilable conflicts between these two uses is  
35 minimal; thus, this impact would be less than significant. Potential conflicts  
36 between flood protection facilities and pedestrian and bicycle infrastructure  
37 are a highly localized issue. For example, where a seepage berm might  
38 conflict with an existing or planned bicycle path, it is highly unlikely to be  
39 influenced by related projects because these other projects would not be  
40 permitted on the seepage berm. It is highly unlikely that related projects  
41 would interact in an additive or cumulative way relative to potential  
42 conflicts with adopted policies, plans, or programs regarding bicycle and  
43 pedestrian facilities. Therefore, no cumulative impact would occur, and the

1 proposed program would not result in a cumulatively considerable  
2 incremental contribution to a significant cumulative impact related to this  
3 topic.

#### 4 ***Utilities and Service Systems***

5 In terms of cumulative impacts, the utility and service providers within the  
6 Extended SPA and the Sacramento and San Joaquin Valley watersheds are  
7 responsible for ensuring that adequate capacity and service systems are  
8 provided within their jurisdictional boundaries. Utility and service system  
9 infrastructure is located throughout the study area and is owned, operated,  
10 and maintained by the public and private service providers described in  
11 Section 3.20, “Utilities and Service Systems.” Solid waste facilities are  
12 operated by private entities and public agencies that contract with counties  
13 and cities for receipt of solid waste. Cumulative impacts related to demand  
14 for natural gas and electricity are addressed above in “Energy,” and the  
15 cumulative impacts on groundwater and surface water supplies are  
16 addressed respectively in “Groundwater Resources” and “Hydrology.”

17 Construction-related activities under NTMAs and LTMA, including  
18 grading and excavation, could encroach on multiple types of utility  
19 equipment and facilities: storm drains, irrigation lines, electric power lines,  
20 gas pipelines, and communications systems. These activities may damage  
21 or require relocation of existing utility infrastructure, interrupt utility  
22 services, or otherwise affect the ability of service providers to quickly  
23 repair damage and/or restore interrupted service. These impacts would  
24 occur on a project-specific basis; mitigation under NTMAs and LTMA  
25 would require consultation with service providers and implementation of  
26 appropriate protection measures (Mitigation Measure UTL-1 (NTMA and  
27 LTMA)), which would reduce potentially significant impacts to a less-than-  
28 significant level. Similar types of consultation, coordination, and protection  
29 measures would be implemented for related projects because these are  
30 standard construction practices (e.g., Underground Service Alert’s “Check  
31 Before You Dig” program) and are often required by local jurisdictions and  
32 other entities as part of construction authorizations. It is highly unlikely  
33 that an NTMA or LTMA would cause a substantial disruption in utility  
34 service to a particular set of customers, and that a related project would  
35 then cause another substantial disruption of service for the same utility to  
36 the same set of customers within a similar time frame. A significant  
37 cumulative impact related to this issue would not occur, and the proposed  
38 program would not result in a cumulatively considerable incremental  
39 contribution to a significant cumulative impact related to disruption of  
40 utility service. In fact, implementing the proposed program would increase  
41 flood protection for utility infrastructure within the Extended SPA,  
42 minimizing incidents of utility service disruptions resulting from failures of  
43 the flood control system.

Construction associated with conveyance-related NTMAs and LTMAAs would generate debris and waste in the short term. The landfills to be used for disposal of construction-related waste would be determined by the construction contractor at the beginning of construction, based on landfill capacity, types of waste, and other factors. Only those landfills determined to have sufficient available capacity to accommodate construction disposal needs would be used. The related projects vary in size and would generate different amounts of solid waste; disposal of solid waste would also occur at landfills determined to have sufficient capacity. In addition, conveyance-related NTMAs and LTMAAs and related projects would be implemented in various geographic locations; therefore, no one landfill would accept all construction-related solid waste associated with conveyance-related NTMAs and LTMAAs and related projects. As a result, a significant cumulative impact related to generation and disposal of construction waste would not occur. Implementing the proposed program would not result in a cumulatively considerable incremental contribution to a significant cumulative impact related to disposal of construction-generated debris and waste.

#### **Water Quality**

The cumulative context for water quality consists of the Extended SPA and the Sacramento and San Joaquin Valley watersheds. The surface water quality conditions of these areas are described in Section 3.21, "Water Quality." In general, water quality conditions during high-water events in the Extended SPA have historically been affected by two factors: potential increases in constituent loading associated with stormwater runoff, and increased sediment loading and turbidity resulting from bank and bed erosion. Pollutants commonly found in stormwater runoff include heavy metals, pesticides and fertilizers, oil and grease, bacteria, and sediment. Water quality often fluctuates over time and is influenced by climate, local agricultural diversions and drainage water, urban runoff, and discharges from wastewater treatment facilities. Salinity is also of concern; excessive salinity may adversely affect crop yields and require more water for salt leaching, may require additional municipal and industrial treatment, may increase salinity levels in agricultural soils and groundwater, and is the primary water quality constraint to recycling wastewater. As urban development has increased throughout California, water quality has been and continues to be adversely affected on a cumulative level by pollutants from urban runoff, agricultural runoff, discharges from wastewater treatment facilities, and other sources, resulting in significant adverse cumulative water quality impacts.

Short-term construction activities associated with NTMAAs and LTMAAs would involve grading and moving earth, which could result in soil erosion, stormwater discharges of suspended solids, and increased turbidity, and

1 could mobilize other pollutants from project-related construction sites.  
2 Intense rainfall and associated stormwater runoff in relatively flat areas  
3 could result in sheet erosion within areas of exposed or stockpiled soils for  
4 short periods of time. If uncontrolled, these soil materials could cause  
5 sedimentation and block drainage channels. Accidental spills of  
6 construction-related contaminants, such as fuels, oils, paints, solvents,  
7 cleaners, and concrete, could also occur during construction activities.  
8 However, each project proponent must prepare a SWPPP consistent with  
9 the existing statewide NPDES discharge permits from the appropriate  
10 RWQCB. The SWPPP and NPDES permit are specifically designed to  
11 reduce adverse effects on the water quality of streams and rivers. The  
12 proponent for each related project that would discharge stormwater runoff  
13 would also be required to prepare a SWPPP and comply with NPDES  
14 discharge permits from the appropriate RWQCB. Therefore, a significant  
15 cumulative impact would not occur. Implementing the proposed program's  
16 construction activities would not result in a cumulatively considerable  
17 incremental contribution to a significant cumulative impact.

18 Project proponents would be required to comply with applicable rules and  
19 regulations for water quality when implementing long-term operational  
20 NTMAs and LTMAAs, including altering reservoir operations. Changes in  
21 reservoir operations included in the proposed program could lead to altered  
22 temperature regimes in downstream flows; could cause changes in relative  
23 concentrations of constituents in various river reaches, as more or less  
24 water is released with constituent concentrations that differ from existing  
25 downstream conditions; and could alter instream water chemistry or  
26 increase loading of certain contaminants. However, to alter reservoir  
27 operations, the project proponent would be required to comply with  
28 existing rules and regulations for water quality, such as total maximum  
29 daily loads. In addition, modifying reservoir operations could potentially  
30 improve water temperature and water quality beyond existing requirements  
31 by releasing colder water and providing pulse flows to support fish species.  
32 These changes would be beneficial. Because of the limited nature of  
33 reservoir operational changes under the proposed program, and because  
34 existing water quality rules and regulations would still apply to reservoir  
35 operations, any potential adverse effects would be minor and this impact  
36 would be less than significant. Only related projects that could affect water  
37 quality in waterways downstream from the reservoirs where operations  
38 would be modified could interact with the effects of reservoir operations to  
39 potentially generate a cumulative impact. Related projects that could affect  
40 water quality would be subject to the broad range of laws and regulations  
41 intended to protect water quality. Therefore, contributions to a cumulative  
42 adverse water quality effect would be minimal. Although existing water  
43 quality conditions indicate a significant cumulative adverse effect from past  
44 and present projects, future projects are unlikely to make a substantial

1 contribution to this effect. Similarly, modified reservoir operations  
2 included in the proposed program would not result in a cumulatively  
3 considerable incremental contribution to a significant cumulative water  
4 quality impact.

5 Implementing NTMAs and LTMAAs would alter the frequency, areal extent,  
6 and duration of floodplain inundation and may result in increased or  
7 decreased availability and mobilization of sediments and associated  
8 contaminants. These contaminants may include pesticides, nutrients,  
9 metals, or coliform bacteria. Altered floodplain inundation may also affect  
10 the bioavailability and transport of mercury. Alternatively, inundation of  
11 floodplains may allow sediments and contaminants already suspended in  
12 the water to settle out of the water before returning to the river, thus  
13 improving downstream water quality. The likelihood of an adverse impact  
14 on water quality would depend largely on past land uses, and would be  
15 determined during subsequent site-specific studies. Potentially significant  
16 adverse effects on water quality from altering floodplain inundation  
17 patterns would be reduced to a less-than-significant level with  
18 implementation of Mitigation Measure SWQ-3 (NTMA and LTMA). This  
19 measure requires Phase I Environmental Site Assessments to determine the  
20 presence or absence of hazardous material at all sites where new floodplain  
21 would be exposed to inundation and mandates cleanup of contaminants  
22 found during the assessment. If the contaminant is sufficient to exceed  
23 applicable regulatory thresholds, then the project proponent will ensure  
24 cleanup of the site, consistent with regulatory requirement. Because any  
25 contaminants present would be cleaned up and floodplains would be  
26 expanded only on limited occasions, any water quality impacts associated  
27 with altered floodplain inundation would be minimal and could potentially  
28 be offset by the water quality benefits of floodplain inundation. Therefore,  
29 implementing the proposed program would not result in a cumulatively  
30 considerable incremental contribution to a significant cumulative impact  
31 related to water quality effects from altered floodplain inundation.

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